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of Agriculture



Natural  
Resources  
Conservation  
Service

In cooperation  
with  
New Mexico  
Agricultural  
Experiment  
Station  
And  
City of Santa  
Fe, Santa Fe  
County,  
National Park  
Service, and  
Department of  
Defense

# Soil Survey of Santa Fe County Area, New Mexico







# How To Use This Soil Survey

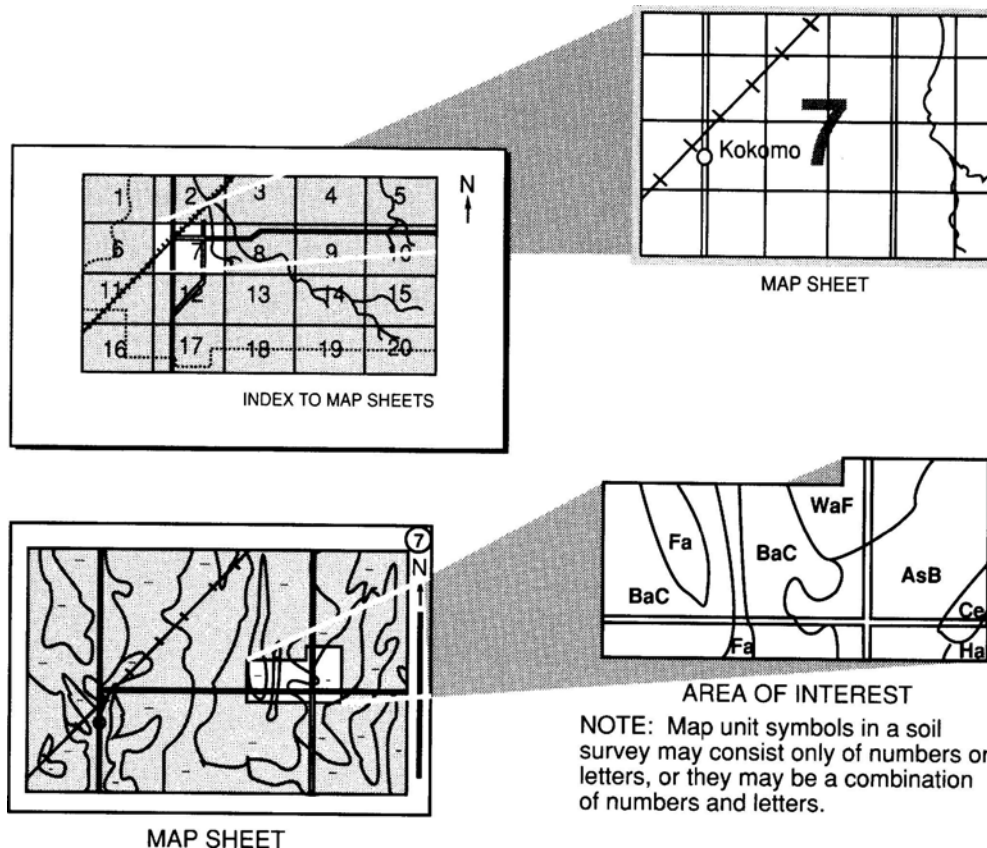
## Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



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This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in September, 2005. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2004. This survey was made cooperatively by the Natural Resources Conservation Service, the National Park Service, and the New Mexico Agricultural Experiment Station.

Only climate tables are included in this survey. Since publication of the soil survey, more data on soil properties may have been collected, new interpretations developed, or existing interpretive criteria modified. Current data tables can be access through the Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov>.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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**Cover: Typical area of map unit 208—Alire-Urban land complex, 2 to 8 percent slopes. The homes in this area are all Santa Fe or Southwest style architecture, typified by flat roofs, earth tone stucco walls, and viega ceilings. The Sangre de Cristo Mountains are in the background, toward the left is Santa Fe Baldy, which at 12,622 feet elevation, is the highest peak in Santa Fe County.**

*Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is <http://www.nrcs.usda.gov>*



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Issued 2009

# Foreword

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This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the New Mexico Cooperative Extension Service.

DENNIS L. ALEXANDER  
State Conservationist  
Natural Resources Conservation Service



# Soil Survey of Santa Fe County Area, New Mexico

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In cooperation with the  
New Mexico Agricultural Experiment Station, City of Santa Fe, Santa Fe County, National Park Service, and Department of Defense

This soil survey updates the Soil Survey of Santa Fe Area, New Mexico published in 1975 (USDA, SCS). This document supercedes the Santa Fe Area, New Mexico Soil Survey, dated 2008. It provides additional information that shows the soils in greater detail.

The survey area is in north central New Mexico (fig. 1) and includes all of Santa Fe County except for lands administered by the U.S. Forest Service, which are geographically in the northeast and west central part of the county. The survey covers an area of 951,000 acres, or about 1,500 square miles. The survey area is bordered by the U.S. Forest Service on the northwest and northeast side, by Rio Arriba County to the north, Los Alamos County on the far northwest corner, Sandoval County to the west, Bernalillo County on the southwest corner, Torrance County to the south, and San Miguel County to the east.

The survey area includes portions of three Major Land Resource Areas (MLRA's): New Mexico and Arizona Plateaus and Mesas—MLRA 36, Southern Rocky Mountains—MLRA 48A, and Pecos-Canadian Plains and Valleys—MLRA 70. (23)

Within the survey area, some in part, are seven pueblo reservations, including Tesuque, Pojoaque, Nambe, San Ildefonso, Santa Clara, Santo Domingo, and Cochiti.

Elevations range from a low of 5,380 feet where the Rio Grande enters U.S. Forest Service land in White Rock Canyon, to a high point of 9,121 feet on top of Atalaya Mountain in the eastern side of the survey area, just east of Santa Fe. Most stream systems in Santa Fe County flow from the east, out of the Sangre De Cristo Mountains, feeding into the Rio Grande river which flows from the northwest. The Santa Cruz River flows through Chimayo and Espanola in the northern part of the survey. The Nambe River and Rio En Medio combine to form the Pojoaque River, and flows through the towns of Nambe, Pojoaque, Jacona, Jaconita, and El Rancho. Rio Tesuque flows through the town of Tesuque in a northwesterly direction until entering the Pojoaque River just west of the town of Pojoaque. The Santa Fe River flows westward through Santa Fe, Agua Fria, and La Cienega before entering the Rio Grande River at Cochiti Reservoir. Glorieta Creek flows southward from Glorieta

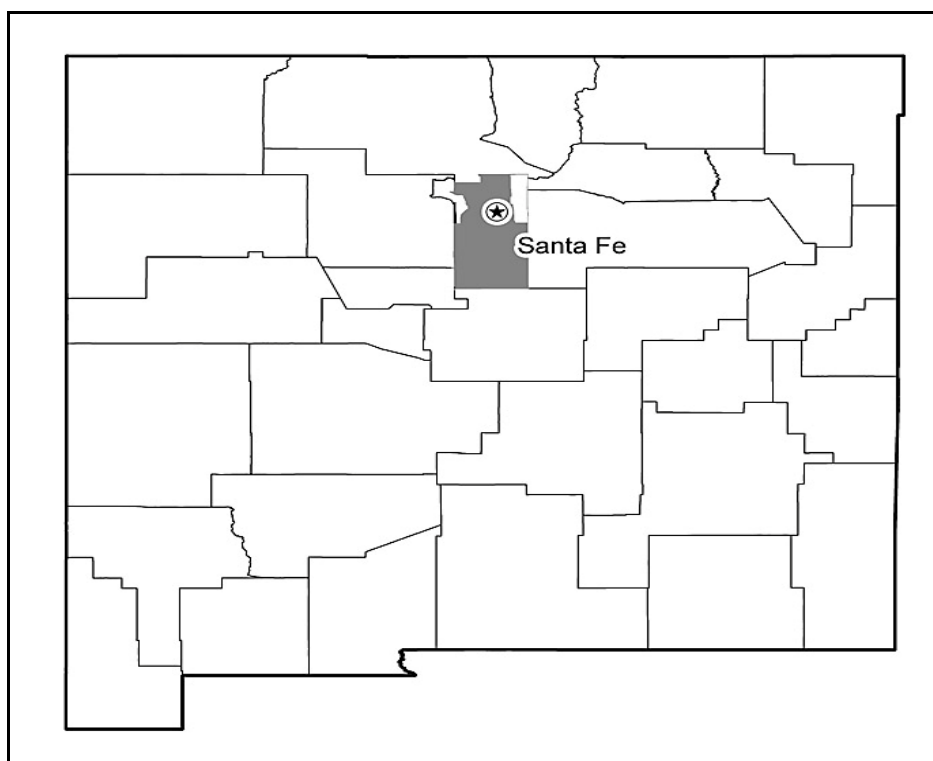


Figure 1.—Location of Santa Fe Area, New Mexico.

Baldy to the town of Glorieta, where it flows eastward until it joins the Pecos River just east of the survey boundary. Galisteo Creek is semi-perennial and flows southwestward from Glorieta Baldy before turning westward at the town of Galisteo.

Soil scientists have determined that there are about 172 different kinds of soils in the survey area that comprise a total of 182 individual map units. Of these 172 soils, 134 are new series proposed within the survey boundary. The soils vary widely in their texture, color, natural drainage, slope, and other characteristics. The climate in which these soils occur also varies widely. The soils in the northern portion of the survey area are at the lowest elevations. These soils, which are gently sloping to rolling with steep breaks occurring in some areas, support mostly scattered juniper with the exception of the riparian areas along the perennial/semi-perennial streams and along the Rio Grande. These areas support a variety of deciduous/evergreen trees that often form a closed canopy.

The soils in the eastern portion of the survey area exist at higher elevations and are generally steeply sloping and high in rock fragments. These soils occur in climates with enough soil moisture to foster the growth of woodland and forest plant communities.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. These discrepancies are the result of different scales and intensities of mapping, varying knowledge of the soils, modifications in soil series concepts, or the extent of soils within the survey area.

## General Nature of the Survey Area

This section contains general information concerning the Santa Fe County area. It briefly discusses the history and development; physiography, geology, and geomorphology; and climate of the survey area.

## History and Development

Although Paleo-Indian and Archaic peoples' nomadic wanderings may have occurred near and in the Santa Fe County area as early as 8,000 and 10,000 B.C., the earliest evidence of human occupation of the area by Archaic-phase hunter-gatherers is around 1750 B.C. (12) Evidence is sporadic up to and during the Developmental Pueblo Phase of 600 to 1100 A.D, however, there was a major influx of humans during the Coalition Phase beginning about 1075 A.D. (12), probably from groups migrating from the Chaco Canyon, Aztec, and Mesa Verde areas. Santa Fe itself was originally occupied by a number of Pueblo Indian villages with founding dates between 1050 and 1150 A.D. The Classic Phase ranging from 1200 to 1600 A.D marks the time period of the widest range of artifacts discovered. During this period, the first appearance of glazed pottery instead of carbon-painted pottery occurred. (12) This, as well as differences in technology, patterns of settlement, and social organization, indicates that a different population replaced the Coalition-phase settlers south of Frijoles Canyon during this time period. This group is classed as Uto-Aztecan and uses the Keres native language. They presently live in the pueblos of Cochiti, Santo Domingo, and San Felipe, as well as other southern pueblos west of the Rio Grande. (12) The original Coalition-phase settlers that continued to occupy land north of Frijoles are of the Kiowa-Tanoan family, and speak the Tewa native language. They are now located in the northern pueblos of Nambe, Pojoaque, Tesuque, San Ildefonso, Santa Clara, and San Juan. It would appear that this total abandonment of the Pajarito Plateau to the Rio Grande Valley floor occurred before 1600 A.D. and prior to the earliest Spanish expeditions into the area (Coronado in 1540 and Oñate in 1598). (12) The east end of Frijoles Canyon close to the survey boundary was reoccupied briefly during the Pueblo Revolt of 1680. (12)

Spanish settlements occurred in the Rio Grande Valley and Santa Fe in the late 1500's, Juan de Oñate establishing the first Spanish capital at the Tewa village of Ohke (San Juan) just north of present day Española in 1598. This was later moved to San Gabriel in 1600, which is at the confluence of the Rio Grande and Rio Chama, then established in Santa Fe in 1610 by Governor Pedro de Peralta, making Santa Fe the second oldest continuously occupied European city in the USA. It is the highest elevation capital city (7,000 feet) and also is the oldest capital city.

Following the pueblo revolt of 1680, the Spanish settlers were driven from Santa Fe and indeed from New Mexico, and spent the next 12 years around the area of El Paso, Texas. Re-conquest of Santa Fe occurred in 1692, when Don Diego de Vargas, with many of the ousted settlers, journeyed up the Camino Real and re-settled Santa Fe. Don Diego then began to expand outside of Santa Fe, and the village of Santa Cruz became colonized around 1695, and a group of families also settled in the area of present day Chimayo about the same time period.

At the same time as Mexico declared independence from Spain, the old Santa Fe Trail was established in 1821 and traveled westward from Kansas City, terminating at the Santa Fe Plaza. Although explored by Rivera in 1765 and attempted by Escalante in 1776, the first documented round trips of the Old Spanish Trail did not occur until 1829. It originated in Santa Fe and traveled northward or northwestward before turning west through Colorado and Utah toward the west coast at Los Angeles. A later trail was developed that took a more westward route that straddled the Arizona-Utah line and joined the Old Spanish Trail southwest of Green River, Utah.

A skirmish of the Civil War was fought in Santa Fe County near the town of Glorieta in 1862.

The railroad arrived into the Lamy area, just south of Santa Fe in the late 1800's. A spur was then created that traveled northward to Santa Fe, and continued

northward through the town of Española to Antonito, Colorado. This northward spur was called "The Chili Line".

## **Physiography, Geology, and Geomorphology**

Santa Fe County encompasses several major physiographic provinces within its boundaries: the Espanola Basin, Galisteo Basin, and Estancia Basin part of the Basin and Range physiographic province, the Glorieta Slope part of the Pecos Valley section of the Great Plains physiographic province, and the southwestern Sangre de Cristo part of the Southern Rocky Mountains province. (11, 15)

The oldest rocks in the survey area, located in the northeast, are the Precambrian age granite, gneiss, and schist that form the core of the Sangre de Cristo Mountains. Although much of this geology is at higher elevations and in forest service lands out of the survey area, there is significant acreage at lower elevations around the towns of Cundiyo in the northeast corner of the survey area, Hyde Park to the east of Santa Fe, and Canada de los Alamos to the southeast of Santa Fe. This formation constitutes the basement rock of much of New Mexico.

Exposed at the surface, the Laramide Orogeny caused the uplifting of mountains several thousand feet above the surrounding areas. The consequent shedding of the overlying material is largely resultant in the formations of huge water bearing aquifers to the south and east (Ogallala Formation).

Adjacent to the granite, gneiss, and schist just east of Santa Fe and north of the Santa Fe River are smaller outcroppings of limestone, sandstone, and shale of the Pennsylvanian Age Magdalena Group.

Around the town of Glorieta are sandstones and shales with some conglomerate of the early Permian Age Sangre de Cristo Formation.

The Glorieta Slope is composed of sandstone and limestone with minor amounts of mudstone formations of Triassic and Permian age redbeds. These formations include the Santa Rosa Sandstone, the Bernal Formation, the San Andres Limestone, the Glorieta Sandstone, and the Yeso Formation.

The Galisteo Basin is composed mainly of shales and sandstones of the Cretaceous Age Mancos Shale and Dakota Sandstone Formations.

The Jemez Volcanic Pile flanks the east side of the Jemez Mountains and was formed from the process of magma buildup beginning about 13 million years ago. This buildup occurred as a result of the formation of the Rio Grande Rift, a separation of the earth's crust in the North American Tectonic plate. As this separation progressed, giant blocks of crust settled into the mantle, forming a series of basins that stretch from Leadville, Colorado to El Paso, Texas that in some places contain more than 20,000 feet of alluvial sediment. (10) A continuance of these eruptions formed the Cerros del Rio Basalt Lava Field around 3 million years ago. Two giant eruptions ejecting over 165 cubic miles of volcanic material occurred about 1.6 and again 1.2 million years ago, forming the Otowi and Tshirege Members of the Bandelier Tuff. Several subsequent eruptions occurred since that time until about 50,000 years ago.

Rocks of comparable age to the Jemez Volcanic Pile are from intrusive igneous eruptions yielding rocks (monzonite) that form high hills and mountains including the Ortiz, San Pedro, and South Mountains and the Cerrillos Hills, and igneous extrusive flows that make up the Espinazo Formation. (16) Next in age is the latite and dacite of the Tschicoma Formation which form the high mountains including Cerro Grande and Parajarito Mountain west of the survey area. The western edge of the survey area also contains exposures of Cerros del Rio Basalt which form mostly structural benches or mesas above White Rock Canyon through which flows the Rio Grande. (16) This part of the survey area also contains the thick deposits of Bandelier Tuff, composed of rhyolitic volcanic ash, which has been highly dissected by deep



southeast trending canyons that have given the area distinct plateau/canyon topography. The plateaus are wide enough that interfluvies occur between canyons; these interfluvies exhibit landscapes that are similar to hills, whereby hillslope positions were identified. The canyons are bounded by cliffs that grade to steep escarpments, grading to footslope positions below. Some valleys in the bottom of the canyons are wide enough to contain some or all components of valley floors, flood plain steps, and flood plains. High stream terrace surfaces are greatly eroded, but do exist in small, localized areas.

The central and north-central part of the survey area is composed primarily of outwash alluvium. This material is derived from granite, gneiss, and schist of the Sangre de Cristo Mountains, and to a lesser extent, river alluvium composed mostly of quartzite and basalt deposited by the ancestral Rio Grande and Rio Chama. In most instances, the former material has buried the latter by piedmonts that slope generally to the west and south, and represent several thousand feet of weakly consolidated alluvium.

## **Climate**

Santa Fe County is located in a region of the U.S. that is continental and rugged in topography in that the climate is represented by considerable variations in both temperature and precipitation. The moisture regimes range from aridic ustic to typic ustic and the temperature regimes from mesic to frigid. Additionally, in areas with measurable slope, aspect can account for great variability in climate.

Summers are warm to hot and the winters are moderately cool to cold with mean annual temperatures ranging from about 40 to 54 degrees F. (3) The diurnal range of temperatures is quite large and may exceed 30 degrees F. The average number of days without freezing temperatures is about 100 in the higher elevations, and 170 in the lower elevation areas.

The temperatures are mild (warmer) than usual for the elevation. This is because of a phenomenon known locally as the Rio Grande Box Effect. At night, cold air drains from northern mountains over 13,000 feet elevation down the Rio Grande Valley, which in turn displaces warmer air at lower elevations. The warm air moves northward up the valley, like water flowing uphill, riding above the stream of cold air towards Santa Fe and Los Alamos. (4) This box effect is what makes Albuquerque famous for its balloon fiesta; with just the right conditions, balloonists can move southward with the cold draft, change their elevation, and catch the northward movement from the warm draft and return close to the point of liftoff. The result of this effect to the Santa Fe-Los Alamos area is much warmer nighttime temperatures whereby Santa Fe, sitting at an elevation 2,000 feet above Albuquerque, often has similar nighttime temperatures.

Mean annual precipitation ranges from 9 to 20 inches, which falls with great variability from month to month and year to year. Seasonal precipitation patterns exhibit a slight maximum in the summer with over one-third of the annual average falling in the months of July to September. (4) The primary source of moisture during the summer monsoon season is air from over the Gulf of Mexico. Southeast winds caused by the circulation patterns around the Bermuda high-pressure area shift westward in the summer. This brings moisture-laden tropical air into the southwestern United States. Occasionally, an influx of moisture from the eastern subtropical Pacific occurs in late summer as weakened storm systems from the Gulf of California disintegrate over Arizona and New Mexico. Most summer precipitation falls as heavy rain from brief, isolated, high-intensity convective thunderstorms which are usually accompanied by strong, gusty winds and occasionally bursts of hail. Flash flooding in normally dry arroyos is common during this time of the year. During the winter, precipitation falls in a widespread pattern and is produced by Pacific

Ocean storm-fronts moving inland from the west. Winter precipitation is much heavier in the higher elevations, where the storm systems are orographically lifted as they pass over the mountains.

Annually, sunshine occurs at an average of 70 percent of the daylight hours with 80 percent during the summer and 60 percent in winter. The average relative humidity in mid-afternoon is about 35 percent. Humidity is higher at night, and the average at dawn is about 65 percent. In late spring and early summer afternoons, humidity drops to as low as 15 to 20 percent. WETS tables provide weather information including temperature and precipitation for the Los Alamos and Santa Fe sites.

## Climate Data

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate tables are created from climate station Santa Fe 2 New Mexico.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Santa Fe 2 in the period 1971 to 2000.

Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 32.4 degrees F and the average daily minimum temperature is 20.2 degrees. The lowest temperature on record, which occurred at Santa Fe 2 on December 23, 1990, is -17 degrees. In summer, the average temperature is 68.8 degrees and the average daily maximum temperature is 83.9 degrees. The highest temperature, which occurred at Santa Fe 2 on June 29, 1998, is 99 degrees.

Growing degree days are shown in Table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 14.29 inches. Of this, about 8.52 inches, or 60 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.00 inches at Santa Fe 2 on August 12, 1981. Thunderstorms occur on about 47 days each year, and most occur in July.

The average seasonal snowfall is 17.0 inches. The greatest snow depth at any one time during the period of record was 16.0 inches recorded on November 23, 1986. On an average, 10 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 16.0 inches recorded on November 23, 1986.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the southeast. Average wind speed is highest, 8.2 miles per hour, in March.

# Soil Survey of Santa Fe County Area, New Mexico

Table 1.—Temperature and Precipitation  
(Recorded for the period 1971-2000 at Santa Fe 2, NM)

| Month     | Temperature (Degrees F)     |                             |         |                                       |                                     |                                                       | Precipitation (Inches) |                            |              |                                                     |                     |
|-----------|-----------------------------|-----------------------------|---------|---------------------------------------|-------------------------------------|-------------------------------------------------------|------------------------|----------------------------|--------------|-----------------------------------------------------|---------------------|
|           | Average<br>daily<br>maximum | Average<br>daily<br>minimum | Average | 2 years in 10<br>will have            |                                     | Average<br>number<br>of<br>growing<br>degree<br>days* | Average                | 2 years in 10<br>will have |              | Average<br>number<br>of days<br>w/0.1<br>or<br>more | Average<br>snowfall |
|           |                             |                             |         | Maximum<br>temperature<br>higher than | Minimum<br>temperature<br>less than |                                                       |                        | less<br>than               | more<br>than |                                                     |                     |
| January   | 42.4                        | 18.3                        | 30.3    | 59                                    | -4                                  | 0                                                     | 0.63                   | 0.14                       | 1.12         | 2                                                   | 3.2                 |
| February  | 48.1                        | 23.2                        | 35.6    | 66                                    | 1                                   | 1                                                     | 0.53                   | 0.13                       | 0.92         | 2                                                   | 2.7                 |
| March     | 55.2                        | 27.6                        | 41.4    | 72                                    | 11                                  | 7                                                     | 0.91                   | 0.39                       | 1.40         | 2                                                   | 2.7                 |
| April     | 63.8                        | 33.4                        | 48.6    | 80                                    | 16                                  | 71                                                    | 0.73                   | 0.09                       | 1.29         | 1                                                   | 0.9                 |
| May       | 72.7                        | 42.1                        | 57.4    | 88                                    | 26                                  | 242                                                   | 1.28                   | 0.38                       | 2.16         | 3                                                   | 0.0                 |
| June      | 82.8                        | 51.0                        | 66.9    | 95                                    | 37                                  | 508                                                   | 1.28                   | 0.21                       | 2.25         | 3                                                   | 0.0                 |
| July      | 85.7                        | 55.6                        | 70.7    | 96                                    | 44                                  | 636                                                   | 2.16                   | 1.03                       | 3.24         | 5                                                   | 0.0                 |
| August    | 83.3                        | 54.4                        | 68.8    | 94                                    | 44                                  | 581                                                   | 2.16                   | 1.39                       | 2.87         | 6                                                   | 0.0                 |
| September | 77.1                        | 47.6                        | 62.3    | 90                                    | 31                                  | 368                                                   | 1.64                   | 0.66                       | 2.59         | 4                                                   | 0.0                 |
| October   | 66.6                        | 36.9                        | 51.8    | 82                                    | 17                                  | 117                                                   | 1.29                   | 0.34                       | 2.12         | 3                                                   | 0.9                 |
| November  | 52.7                        | 26.1                        | 39.4    | 71                                    | 6                                   | 6                                                     | 1.04                   | 0.37                       | 1.64         | 2                                                   | 2.8                 |
| December  | 43.8                        | 19.0                        | 31.4    | 60                                    | -3                                  | 0                                                     | 0.65                   | 0.09                       | 1.10         | 2                                                   | 3.8                 |
| Yearly:   | ---                         | ---                         | ---     | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Average   | 64.5                        | 36.2                        | 50.4    | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Extreme   | 99                          | -17                         | ---     | 97                                    | -8                                  | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Total     | ---                         | ---                         | ---     | ---                                   | ---                                 | 2,537                                                 | 14.29                  | 11.45                      | 16.33        | 35                                                  | 17.0                |

Average number of days per year with at least 1 inch of snow on the ground: 10

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

# Soil Survey of Santa Fe County Area, New Mexico

Table 2.—Freeze Dates in Spring and Fall  
(Recorded in the period 1971–2000 at Santa Fe 2, NM)

| Probability                          | Temperature   |               |               |
|--------------------------------------|---------------|---------------|---------------|
|                                      | 24°F or lower | 28°F or lower | 32°F or lower |
| Last freezing temperature in spring: |               |               |               |
| 1 year in 10 later than--            | May 3         | May 14        | May 21        |
| 2 year in 10 later than--            | April 27      | May 8         | May 17        |
| 5 year in 10 later than--            | April 15      | April 25      | May 8         |
| First freezing temperature in fall:  |               |               |               |
| 1 year in 10 earlier than--          | October 16    | October 1     | September 23  |
| 2 years in 10 earlier than--         | October 21    | October 7     | September 28  |
| 5 years in 10 earlier than--         | October 31    | October 19    | October 9     |

Table 3.—Growing Season  
(Recorded for the period 1971–2000 at Santa Fe 2, NM)

| Probability   | Daily Minimum Temperature       |                                 |                                 |
|---------------|---------------------------------|---------------------------------|---------------------------------|
|               | Number of days higher than 24°F | Number of days higher than 28°F | Number of days higher than 32°F |
|               | <u>Days</u>                     | <u>Days</u>                     | <u>Days</u>                     |
| 9 years in 10 | 169                             | 148                             | 129                             |
| 8 years in 10 | 179                             | 157                             | 137                             |
| 5 years in 10 | 197                             | 173                             | 153                             |
| 2 years in 10 | 215                             | 190                             | 169                             |
| 1 year in 10  | 225                             | 199                             | 177                             |

## Soil Survey of Santa Fe County Area, New Mexico

Climate tables are created from climate station Los Alamos, New Mexico

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 4 gives data on temperature and precipitation for the survey area as recorded at Los Alamos in the period 1971 to 2000.

Table 5 shows probable dates of the first freeze in fall and the last freeze in spring. Table 6 provides data on the length of the growing season.

In winter, the average temperature is 30.5 degrees F and the average daily minimum temperature is 19.5 degrees. The lowest temperature on record, which occurred at Los Alamos on January 13, 1963, is -16 degrees. In summer, the average temperature is 65.9 degrees and the average daily maximum temperature is 78.9 degrees. The highest temperature, which occurred at Los Alamos on June 28, 1998, is 95 degrees.

Growing degree days are shown in Table 4. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 18.95 inches. Of this, about 11.24 inches, or 59 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.47 inches at Los Alamos on July 31, 1968. Thunderstorms occur on about 45 days each year, and most occur in July.

The average seasonal snowfall is 58.8 inches. The greatest snow depth at any one time during the period of record was 40 inches recorded on January 16, 1987. On an average, 48 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 22.0 inches recorded on January 15, 1987 and December 6, 1978.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the south-southwest. Average wind speed is highest, 7.7 miles per hour, in March.

# Soil Survey of Santa Fe County Area, New Mexico

Table 4.—Temperature and Precipitation  
(Recorded for the period 1971-2000 at Los Alamos, NM)

| Month     | Temperature (Degrees F)     |                             |         |                                       |                                     |                                                       | Precipitation (Inches) |                            |              |                                                     |                     |
|-----------|-----------------------------|-----------------------------|---------|---------------------------------------|-------------------------------------|-------------------------------------------------------|------------------------|----------------------------|--------------|-----------------------------------------------------|---------------------|
|           | Average<br>daily<br>maximum | Average<br>daily<br>minimum | Average | 2 years in 10<br>will have            |                                     | Average<br>number<br>of<br>growing<br>degree<br>days* | Average                | 2 years in 10<br>will have |              | Average<br>number<br>of days<br>w/0.1<br>or<br>more | Average<br>snowfall |
|           |                             |                             |         | Maximum<br>temperature<br>higher than | Minimum<br>temperature<br>less than |                                                       |                        | less<br>than               | more<br>than |                                                     |                     |
| January   | 39.5                        | 17.7                        | 28.6    | 57                                    | -4                                  | 0                                                     | 0.96                   | 0.23                       | 1.68         | 2                                                   | 14.2                |
| February  | 44.2                        | 21.8                        | 33.0    | 62                                    | 0                                   | 0                                                     | 0.76                   | 0.17                       | 1.21         | 2                                                   | 9.1                 |
| March     | 50.8                        | 27.0                        | 38.9    | 68                                    | 9                                   | 5                                                     | 1.28                   | 0.50                       | 2.04         | 3                                                   | 10.4                |
| April     | 58.8                        | 33.1                        | 45.9    | 75                                    | 16                                  | 43                                                    | 1.05                   | 0.23                       | 1.82         | 2                                                   | 4.9                 |
| May       | 67.9                        | 41.7                        | 54.8    | 83                                    | 27                                  | 182                                                   | 1.43                   | 0.39                       | 2.55         | 3                                                   | 0.9                 |
| June      | 78.4                        | 51.1                        | 64.7    | 91                                    | 36                                  | 442                                                   | 1.44                   | 0.47                       | 2.21         | 3                                                   | 0.0                 |
| July      | 80.6                        | 54.6                        | 67.6    | 91                                    | 46                                  | 544                                                   | 2.97                   | 1.73                       | 4.26         | 7                                                   | 0.0                 |
| August    | 77.6                        | 53.1                        | 65.4    | 88                                    | 43                                  | 476                                                   | 3.32                   | 2.12                       | 4.41         | 8                                                   | 0.0                 |
| September | 71.7                        | 47.0                        | 59.3    | 85                                    | 30                                  | 288                                                   | 2.08                   | 1.12                       | 3.02         | 4                                                   | 0.0                 |
| October   | 61.2                        | 36.7                        | 48.9    | 77                                    | 17                                  | 76                                                    | 1.54                   | 0.34                       | 2.64         | 3                                                   | 2.9                 |
| November  | 48.2                        | 25.9                        | 37.0    | 66                                    | 6                                   | 2                                                     | 1.19                   | 0.34                       | 1.96         | 2                                                   | 5.3                 |
| December  | 40.5                        | 19.0                        | 29.8    | 57                                    | -2                                  | 0                                                     | 0.92                   | 0.17                       | 1.55         | 2                                                   | 11.2                |
| Yearly:   | ---                         | ---                         | ---     | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Average   | 59.9                        | 35.7                        | 47.8    | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Extreme   | 95                          | -16                         | ---     | 92                                    | -8                                  | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Total     | ---                         | ---                         | ---     | ---                                   | ---                                 | 2,059                                                 | 18.95                  | 15.85                      | 21.86        | 41                                                  | 58.8                |

Average number of days per year with at least 1 inch of snow on the ground: 48

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

# Soil Survey of Santa Fe County Area, New Mexico

Table 5.—Freeze Dates in Spring and Fall  
(Recorded in the period 1971-2000 at Los Alamos, NM)

| Probability                          | Temperature   |               |               |
|--------------------------------------|---------------|---------------|---------------|
|                                      | 24°F or lower | 28°F or lower | 32°F or lower |
| Last freezing temperature in spring: |               |               |               |
| 1 year in 10 later than--            | April 29      | May 13        | May 27        |
| 2 years in 10 later than--           | April 24      | May 8         | May 22        |
| 5 year in 10 later than--            | April 13      | April 28      | May 10        |
| First freezing temperature in fall:  |               |               |               |
| 1 year in 10 earlier than--          | October 15    | September 27  | September 19  |
| 2 years in 10 earlier than--         | October 20    | October 3     | September 25  |
| 5 years in 10 earlier than--         | October 30    | October 16    | October 6     |

Table 6.—Growing Season  
(Recorded for the period 1971-2000 at Los Alamos, NM)

| Probability   | Daily Minimum Temperature       |                                 |                                 |
|---------------|---------------------------------|---------------------------------|---------------------------------|
|               | Number of days higher than 24°F | Number of days higher than 28°F | Number of days higher than 32°F |
|               | <u>Days</u>                     | <u>Days</u>                     | <u>Days</u>                     |
| 9 years in 10 | 175                             | 145                             | 125                             |
| 8 years in 10 | 183                             | 153                             | 133                             |
| 5 years in 10 | 199                             | 170                             | 148                             |
| 2 years in 10 | 216                             | 186                             | 163                             |
| 1 year in 10  | 224                             | 195                             | 170                             |

## Soil Survey of Santa Fe County Area, New Mexico

Climate tables are created from climate station Stanley 1 NNE New Mexico

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 7 gives data on temperature and precipitation for the survey area as recorded at Stanley 1 NNE in the period 1971 to 2000. Table 8 shows probable dates of the first freeze in fall and the last freeze in spring. Table 9 provides data on the length of the growing season.

In winter, the average temperature is 31.4 degrees F and the average daily minimum temperature is 17.3 degrees. The lowest temperature on record, which occurred at Stanley 1 NNE on January 7, 1971, is -30 degrees. In summer, the average temperature is 68.1 degrees and the average daily maximum temperature is 84.9 degrees. The highest temperature, which occurred at Stanley 1 NNE on June 24, 1971, is 101 degrees.

Growing degree days are shown in Table 7. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 13.80 inches. Of this, about 9.11 inches, or 66 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.55 inches at Stanley 1 NNE on October 30, 1959. Thunderstorms occur on about 45 days each year, and most occur in July.

The average seasonal snowfall is 20.7 inches. The greatest snow depth at any one time during the period of record was 29 inches recorded on December 31, 2006 and the following day. On an average, 25 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 14.1 inches recorded on December 30, 2006.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the southeast. Average wind speed is highest, 8.2 miles per hour, in March.



# Soil Survey of Santa Fe County Area, New Mexico

Table 7.—Temperature and Precipitation  
(Recorded for the period 1971-2000 at Stanley, NM)

| Month     | Temperature (Degrees F)     |                             |         |                                       |                                     |                                                       | Precipitation (Inches) |                            |              |                                                     |                     |
|-----------|-----------------------------|-----------------------------|---------|---------------------------------------|-------------------------------------|-------------------------------------------------------|------------------------|----------------------------|--------------|-----------------------------------------------------|---------------------|
|           | Average<br>daily<br>maximum | Average<br>daily<br>minimum | Average | 2 years in 10<br>will have            |                                     | Average<br>number<br>of<br>growing<br>degree<br>days* | Average                | 2 years in 10<br>will have |              | Average<br>number<br>of days<br>w/0.1<br>or<br>more | Average<br>snowfall |
|           |                             |                             |         | Maximum<br>temperature<br>higher than | Minimum<br>temperature<br>less than |                                                       |                        | less<br>than               | more<br>than |                                                     |                     |
| January   | 42.9                        | 15.9                        | 29.4    | 62                                    | -10                                 | 0                                                     | 0.50                   | 0.17                       | 0.85         | 2                                                   | 4.5                 |
| February  | 49.3                        | 20.0                        | 34.7    | 67                                    | -5                                  | 0                                                     | 0.35                   | 0.12                       | 0.58         | 1                                                   | 3.6                 |
| March     | 57.0                        | 24.9                        | 41.0    | 74                                    | 6                                   | 10                                                    | 0.61                   | 0.18                       | 0.92         | 2                                                   | 2.7                 |
| April     | 64.8                        | 30.7                        | 47.7    | 81                                    | 13                                  | 61                                                    | 0.59                   | 0.10                       | 1.02         | 1                                                   | 1.5                 |
| May       | 74.2                        | 39.6                        | 56.9    | 88                                    | 22                                  | 230                                                   | 1.12                   | 0.25                       | 1.99         | 2                                                   | 0.1                 |
| June      | 84.0                        | 48.2                        | 66.1    | 97                                    | 35                                  | 483                                                   | 1.50                   | 0.30                       | 2.45         | 3                                                   | 0.0                 |
| July      | 86.7                        | 53.5                        | 70.1    | 97                                    | 37                                  | 622                                                   | 2.20                   | 1.16                       | 3.28         | 5                                                   | 0.0                 |
| August    | 83.9                        | 52.4                        | 68.1    | 94                                    | 42                                  | 561                                                   | 2.74                   | 1.58                       | 3.90         | 6                                                   | 0.0                 |
| September | 77.9                        | 44.8                        | 61.4    | 90                                    | 27                                  | 345                                                   | 1.55                   | 0.74                       | 2.37         | 4                                                   | 0.0                 |
| October   | 67.6                        | 33.4                        | 50.5    | 83                                    | 15                                  | 95                                                    | 1.40                   | 0.23                       | 2.36         | 3                                                   | 0.7                 |
| November  | 53.7                        | 23.6                        | 38.7    | 71                                    | 1                                   | 5                                                     | 0.70                   | 0.18                       | 1.22         | 2                                                   | 2.9                 |
| December  | 44.3                        | 15.9                        | 30.1    | 62                                    | -6                                  | 0                                                     | 0.51                   | 0.07                       | 0.87         | 1                                                   | 4.7                 |
| Yearly:   | ---                         | ---                         | ---     | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Average   | 65.5                        | 33.6                        | 49.6    | ---                                   | ---                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Extreme   | 101                         | -30                         | ---     | 98                                    | -14                                 | ---                                                   | ---                    | ---                        | ---          | ---                                                 | ---                 |
| Total     | ---                         | ---                         | ---     | ---                                   | ---                                 | 2,412                                                 | 13.80                  | 10.66                      | 16.63        | 32                                                  | 20.7                |

Average number of days per year with at least 1 inch of snow on the ground: 25

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

# Soil Survey of Santa Fe County Area, New Mexico

Table 8.—Freeze Dates in Spring and Fall  
(Recorded for the period 1971-2000 at Stanley, NM)

| Probability                          | Temperature   |               |               |
|--------------------------------------|---------------|---------------|---------------|
|                                      | 24°F or lower | 28°F or lower | 32°F or lower |
| Last freezing temperature in spring: |               |               |               |
| 1 year in 10 later than--            | May 10        | May 21        | May 27        |
| 2 years in 10 later than--           | May 4         | May 15        | May 23        |
| 5 years in 10 later than--           | April 22      | May 4         | May 15        |
| First freezing temperature in fall:  |               |               |               |
| 1 year in 10 earlier than--          | September 30  | September 24  | September 19  |
| 2 years in 10 earlier than--         | October 6     | September 28  | September 23  |
| 5 years in 10 earlier than--         | October 17    | October 7     | October 1     |

Table 9.—Growing Season  
(Recorded for the period 1971-2000 at Stanley, NM)

| Probability   | Daily Minimum Temperature       |                                 |                                 |
|---------------|---------------------------------|---------------------------------|---------------------------------|
|               | Number of days higher than 24°F | Number of days higher than 28°F | Number of days higher than 32°F |
|               | <u>Days</u>                     | <u>Days</u>                     | <u>Days</u>                     |
| 9 years in 10 | 156                             | 132                             | 119                             |
| 8 years in 10 | 163                             | 140                             | 125                             |
| 5 years in 10 | 177                             | 155                             | 138                             |
| 2 years in 10 | 190                             | 170                             | 150                             |
| 1 year in 10  | 198                             | 178                             | 157                             |

## How This Survey Was Made

This survey was made as an update to the Santa Fe County Area Soil Survey to provide recent and higher resolution information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location as well as a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the types of native plants; and the kinds of bedrock. Many soil profiles were carefully studied, observing the sequence of natural layers, or horizons, in a soil profile. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been altered by biological activity.

The soils and miscellaneous areas in the survey area exist in an orderly pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform (fig. 2 and fig. 3). By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles studied. Observations were recorded on soil color, depth, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that facilitate the identification and classification of the soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. These divisions are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the soil profile. After the soils are classified and named in the survey area, they are compared with similar soils in the same taxonomic class in other areas in order to confirm, revise, and update data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions and additional interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

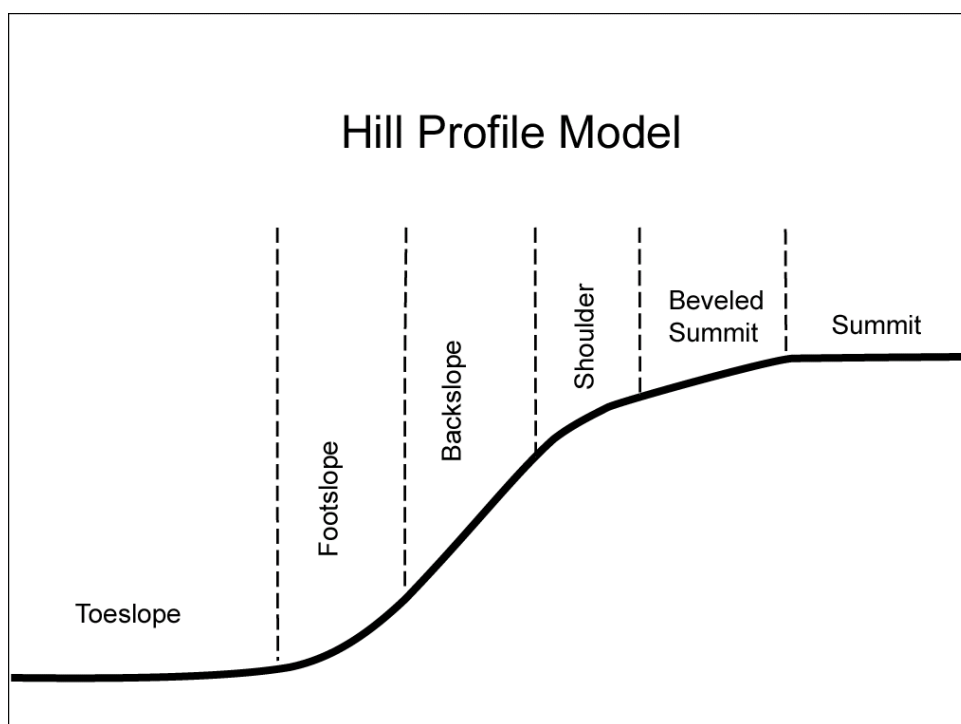


Figure 2.—Cross-section diagram of a hill. Many soils in this report are defined as being on a specific landform position. This simple hill profile model shows landforms positions that are defined in the glossary.

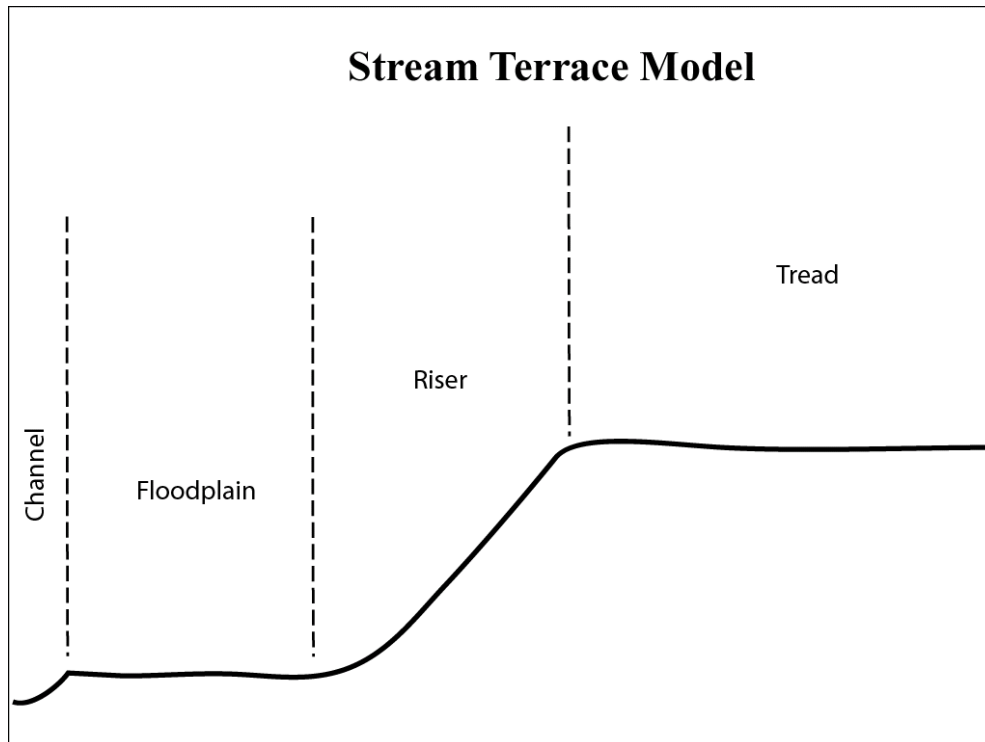


Figure 3.—Cross-section diagram of a stream terrace. The individual soils are defined as being on either the tread (flat part of the stream terrace), or the steep riser part.

## Soil Survey of Santa Fe County Area, New Mexico

Predictions about soil behavior are based not only on soil properties but also on variables such as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After locating and identifying the significant natural bodies of soil in the survey area, the boundaries of these bodies were drawn on aerial photographs and each labeled as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately. The use of overlapping vertical aerial photographs and optical devices known as stereoscopes enabled the soil scientists to see landscapes and individual landforms in three dimensions. This technique is known as stereoscopy and is an essential tool for the accurate placement of soil delineations (boundaries) in areas of medium to high relief. Different tonal patterns on aerial photographs are often related to distinct differences in soil, slope, vegetation, moisture, erosion, and geology. Tonal differences are additional tools used by soil scientists to make accurate soil maps on aerial photographs.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas, or soils in the previous survey of this area. (8) Differences are the result of a better knowledge of soils, modifications in soil series concepts, variations in the intensity of mapping or in the extent of the soils in the survey areas, or differences in map unit design.



## Detailed Soil Map Units

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The map unit delineation on a soil map represents an area dominated by one or several major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects and characteristically have variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and usually some inclusions or included soils that belong to other taxonomic classes.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be reasonably separated on the soil maps at the desired map resolution. Inclusions are therefore mentioned in the map unit descriptions.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of soil data. The objectives of soil mapping are not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

Each map unit is identified with a map unit symbol and a map unit description which includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

A collection of soils with similar properties make up a soil *series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example *Panky loam, 1 to 4 percent slopes* is a phase of the *Panky* series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. *Zozobra-Jaconita complex, 5 to 25 percent slopes* is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up

of all of them. *Morenda*, *Fiesta*, and *Espanola* soils, 1 to 85 percent slopes, flooded is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. *Rock outcrop* is an example.

A list of the acreage and proportionate extent of each map unit can be found online at <http://websoilsurvey.nrcs.usda.gov>. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## **100—Panky loam, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,900 to 6,700 feet (1,798 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Panky and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Panky soils**

*Landscape:* Fan piedmonts (fig. 4)

*Landform:* Eroded fan remnants (fig. 5)

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, schist, loess, and volcanic ash

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 1 to 5 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.4 inches (high)

*Shrink-swell potential:* About 2.4 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 30 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, broom snakeweed, galleta, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

AE—0 to 3 inches; loam

Bt—3 to 8 inches; clay loam

Btk1—8 to 11 inches; clay loam

Btk2—11 to 17 inches; loam

Bk1—17 to 36 inches; loam



## Soil Survey of Santa Fe County Area, New Mexico

Bk2—36 to 53 inches; loam  
Bkq1—53 to 66 inches; loam  
Bkq2—66 to 88 inches; loam  
BCK—88 to 115 inches; loam

### *Minor Components Composition*

Tetilla and similar soils: About 5 percent  
Zozobra and similar soils: About 2 percent  
Khapo and similar soils: About 2 percent  
Urban land: About 1 percent



Figure 4.—An area of Panky loam, 1 to 4 percent slopes. The Ortiz Mountains are in the background on the left. The Sandia Mountains are in the background to the right.

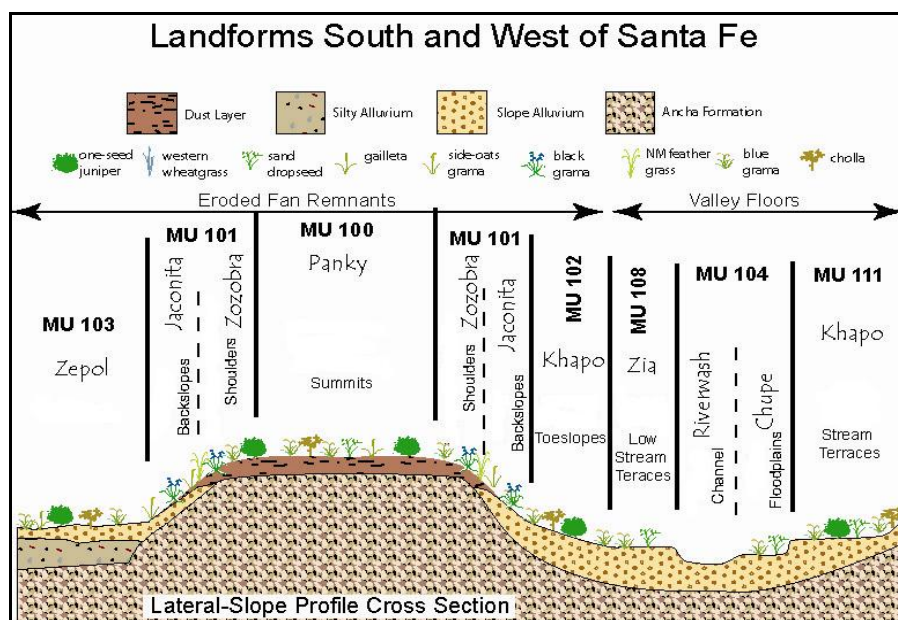


Figure 5.—Cross-section diagram of landforms and landform position for map units south and west of Santa Fe.

## **101—Zozobra-Jaconita complex, 5 to 25 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,900 feet (1,646 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Zozobra and similar soils: 45 percent

Jaconita and similar soils: 40 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Zozobra soils**

*Landscape:* Fan piedmonts (fig. 6)

*Landform:* Eroded fan remnants (fig. 5)

*Position on landform:* Shoulders

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 5 to 12 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent rounded cobbles; about 25 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 20 to 35 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 33 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, galleta, sideoats grama, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

ABk—0 to 3 inches; gravelly sandy loam

Bk1—3 to 7 inches; loam

Bk2—7 to 15 inches; loam

Bk3—15 to 24 inches; sandy loam

2Bk4—24 to 28 inches; gravelly loamy sand

2Bk5—28 to 35 inches; gravelly loamy coarse sand

2Bk6—35 to 46 inches; loamy coarse sand

2Bk7—46 to 54 inches; gravelly coarse sand

2Bk8—54 to 67 inches; very gravelly loamy coarse sand

2C—67 to 88 inches; gravelly coarse sand

### **Jaconita soils**

*Landscape:* Fan piedmonts (fig. 6)

*Landform:* Eroded fan remnants (fig. 5)

*Position on landform:* Backslopes

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 10 to 25 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded cobbles; about 40 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass,  
oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6e

### **Typical Profile**

ABk—0 to 2 inches; very gravelly coarse sandy loam

Bk1—2 to 6 inches; very gravelly coarse sandy loam

Bk2—6 to 14 inches; extremely gravelly loamy coarse sand

Bk3—14 to 45 inches; very gravelly coarse sand

Bk4—45 to 56 inches; very gravelly loamy coarse sand

C1—56 to 78 inches; gravelly coarse sand

C2—78 to 92 inches; very gravelly coarse sand

C3—92 to 104 inches; loamy fine sand

C4—104 to 118 inches; fine sand

### **Minor Components Composition**

Khapo and similar soils: About 6 percent

Haozous and similar soils: About 4 percent

Churipa and similar soils: About 3 percent

Urban land: About 2 percent

## **102—Khapo sandy loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,700 feet (1,646 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Khapo and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Khapo soils**

*Landscape:* Fan piedmonts (fig. 6)

*Landform:* Eroded fan remnants (fig. 5)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, schist, loess, and volcanic ash

*Slope:* 3 to 8 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.1 inches (moderate)

*Shrink-swell potential:* About 1.8 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; sandy loam

BA—2 to 5 inches; sandy loam

Bt—5 to 11 inches; sandy clay loam

Btk1—11 to 29 inches; fine sandy loam

Btk2—29 to 43 inches; fine sandy loam

Bk1—43 to 72 inches; fine sandy loam

Bk2—72 to 89 inches; sandy loam

Bkb—89 to 120 inches; loam

### ***Minor Components Composition***

Jaconita and similar soils: About 5 percent

Panky and similar soils: About 4 percent

## Soil Survey of Santa Fe County Area, New Mexico

Chupe and similar soils: About 3 percent  
Zepol and similar soils: About 2 percent  
Urban land: About 1 percent



**Figure 6.—An area of Zozobra-Jaconita complex, 5 to 25 percent slopes. The Jaconita soils are on the steep backslopes, and the Zozobra soils are on the upper rounded summits. An area of Khapo sandy loam, 3 to 8 percent slopes is in the foreground. The Sangre de Cristo Mountains are in the background.**

## **103—Zepol silt loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 7,000 feet (1,768 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Zepol and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Zepol soils**

*Landscape:* Fan piedmonts

*Landform:* Narrow flood plains on eroded fan remnants (fig. 5)

*Parent material:* Alluvium derived from loess, volcanic ash, pumice, basalt lapilli, granite, and schist

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 10.7 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Flooding hazard:* Occasional

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

AC1—0 to 3 inches; silt loam

AC2—3 to 6 inches; silt loam

Bt1—6 to 12 inches; silt loam

Bt2—12 to 22 inches; silty clay loam

Bt3—22 to 27 inches; silt loam

Btk1—27 to 35 inches; silt loam

Btk2—35 to 46 inches; silt loam

Bk1—46 to 75 inches; silt loam

Bk2—75 to 89 inches; silt loam

BCK—89 to 114 inches; loam

***Minor Components Composition***

Zia and similar soils: About 6 percent

Chupe and similar soils: About 5 percent

Khapo and similar soils: About 4 percent

## **104—Chupe-Riverwash complex, 1 to 3 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,500 feet (1,646 to 2,286 meters)

*Mean annual precipitation:* 9 to 13 inches (229 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Chupe and similar soils: 65 percent

Riverwash: 30 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Chupe soils**

*Landscape:* Valleys (fig. 7)

*Landform:* Narrow flood plains on valley floors (fig. 5)

*Parent material:* Alluvium derived from granite, gneiss, schist, granitic sandstone, and mudstone

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 1.9 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

AC—0 to 3 inches; loamy coarse sand

C1—3 to 10 inches; gravelly coarse sand

C2—10 to 26 inches; gravelly coarse sand

C3—26 to 31 inches; very gravelly coarse sand

C4—31 to 37 inches; gravelly coarse sand

C5—37 to 42 inches; very gravelly coarse sand

C6—42 to 50 inches; sandy clay loam

C7—50 to 65 inches; loamy coarse sand

C8—65 to 84 inches; coarse sand

C9—84 to 96 inches; gravelly coarse sand



## **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe soil.

*Landscape:* Valleys (fig. 7)

*Landform:* Flood plains on valley floors

*Parent material:* Alluvium derived from mixed

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### **Minor Components Composition**

Zia and similar soils: About 3 percent

Koshare and similar soils: About 1 percent

Khapo and similar soils: About 1 percent



**Figure 7.—An area of Chupe-Riverwash complex, 1 to 3 percent slopes, flooded. Zia soils are on the terrace behind the Riverwash.**

## **105—Dumps, sanitary landfill**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,500 feet (1,737 to 2,286 meters)

*Mean annual precipitation:* 10 to 15 inches (254 to 381 millimeters)

*Mean annual air temperature:* 46 to 52 degrees F (8.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Dumps: 80 percent

Minor components: 20 percent

### ***Component Descriptions***

#### **Dumps**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Summits

*Parent material:* Mine spoil or earthy fill

*Slope:* 1 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 25 percent subrounded gravel

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Land capability subclass (nonirrigated):* 8e

### ***Minor Components Composition***

Encantado and similar soils: About 6 percent

Tanoan and similar soils: About 5 percent

Zozobra and similar soils: About 4 percent

Khapo and similar soils: About 3 percent

Nazario and similar soils: About 1 percent

Panky and similar soils: About 1 percent

## 106—Pits

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,700 feet (1,646 to 2,347 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Pits: 80 percent

Minor components: 20 percent

### ***Component Descriptions***

#### **Pits**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 8 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 5 percent subrounded cobbles; about 35 percent subrounded gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 4.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Riovista and similar soils: About 8 percent

Devargas and similar soils: About 4 percent

Paraje and similar soils: About 3 percent

Delvalle and similar soils: About 3 percent

Agua Fria and similar soils: About 2 percent

## **107—Riverwash, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,500 feet (1,707 to 1,981 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Riverwash: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe and Cuyamungue soils.

*Landscape:* Valleys

*Landform:* Channels on valley floors (fig. 11)

*Parent material:* Alluvium derived from mixed

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Chupe and similar soils: About 8 percent

Cuyamungue and similar soils: About 7 percent

## **108—Zia fine sandy loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,600 feet (1,676 to 2,012 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Zia and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Zia soils**

*Landscape:* Valleys (fig. 8)

*Landform:* Low stream terraces on valley floors (fig. 5)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granitic sandstone and mudstone

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 49 to 57 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.4 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Very rare

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 4 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

AC—2 to 7 inches; fine sandy loam

C1—7 to 12 inches; very fine sandy loam

C2—12 to 22 inches; sand

C3—22 to 40 inches; very fine sandy loam

C4—40 to 53 inches; loam

2C5—53 to 69 inches; stratified sand to very gravelly coarse sand

3Btkb—69 to 79 inches; loam

3Bkb—79 to 91 inches; coarse sandy loam

3BCkb—91 to 99 inches; gravelly coarse sand

***Minor Components Composition***

Khapo and similar soils: About 6 percent

Zepol and similar soils: About 4 percent



**Figure 8.—An area of Zia fine sandy loam, 0 to 2 percent slopes on a low stream terrace.**

## **109—Tetilla loam, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 6,800 feet (1,829 to 2,073 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Tetilla and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Tetilla soils**

*Landscape:* Lava fields

*Landform:* Interfluves on undulating plateaus (fig. 9)

*Position on landform:* Toeslopes, footslopes

*Parent material:* Alluvium derived from loess, volcanic ash, and basalt

*Slope:* 1 to 5 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.8 inches (high)

*Shrink-swell potential:* About 4.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 33 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

AE—0 to 3 inches; loam

Bt1—3 to 8 inches; clay loam

Bt2—8 to 21 inches; clay loam

Btk1—21 to 40 inches; loam

Btk2—40 to 57 inches; sandy clay loam

Bk1—57 to 77 inches; gravelly sandy loam

Bk2—77 to 86 inches; gravelly sandy loam

**Minor Components Composition**

Calabasas and similar soils: About 4 percent

Panky and similar soils: About 3 percent

Jaconita and similar soils: About 2 percent

Chupe and similar soils: About 1 percent

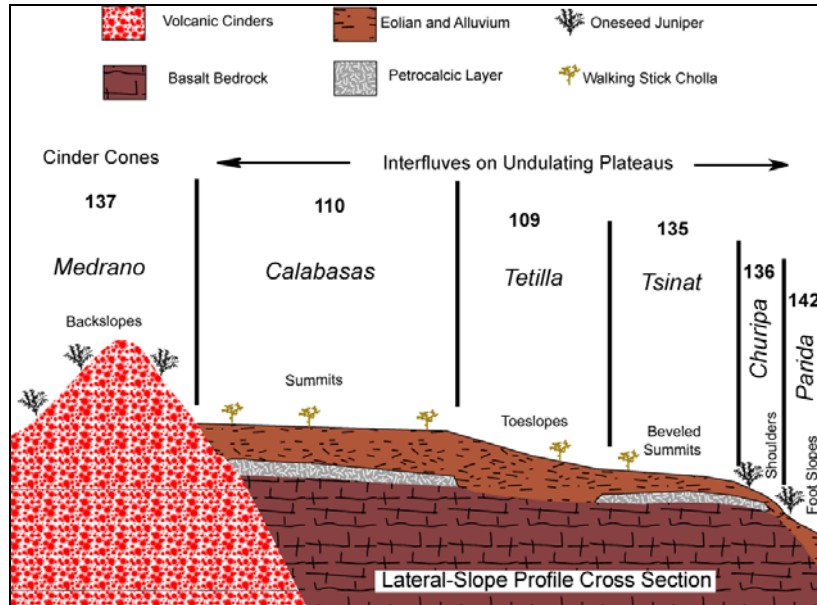


Figure 9.—Cross-section diagram of landform and landform position for map units west of Santa Fe on the Caja del Rio Plateau.



## **110—Calabasas loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,800 feet (1,768 to 2,073 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Calabasas and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Calabasas soils**

*Landscape:* Lava fields (fig. 10)

*Landform:* Interfluves on undulating plateaus (fig. 9)

*Position on landform:* Summits

*Parent material:* Eolian material derived from volcanic ash and pumice, and alluvium derived from loess and basalt

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 39 to 59 inches to petrocalcic; 39 to 79 inches to duripan

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 7.4 inches (moderate)

*Shrink-swell potential:* About 2.9 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 45 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, threeawn, ring muhly, sand dropseed, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; loam

Bt—4 to 12 inches; clay loam

Btk1—12 to 17 inches; clay loam

Btk2—17 to 25 inches; loam

Bk—25 to 32 inches; very fine sandy loam

Bkq—32 to 49 inches; gravelly sandy loam

Bkqm—49 to 54 inches; cemented material

B'kq—54 to 70 inches; fine sandy loam

B'kqm—70 to 81 inches; cemented material

***Minor Components Composition***

Tetilla and similar soils: About 5 percent

Tsinat and similar soils: About 3 percent

Truehill and similar soils: About 1 percent

Churipa and similar soils: About 1 percent



**Figure 10.—An area of Calabasas loam, 1 to 3 percent slopes. The Ortiz Mountains are in the background.**

## **111—Khapo fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,500 feet (1,676 to 2,286 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Khapo and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Khapo soils**

*Landscape:* Valleys

*Landform:* High stream terraces (fig. 5)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granitic sandstone, mudstone, and volcanic ash

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.1 inches (moderate)

*Shrink-swell potential:* About 1.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

BA—2 to 5 inches; fine sandy loam

Bt—5 to 10 inches; fine sandy loam

Btk1—10 to 20 inches; fine sandy loam

Btk2—20 to 28 inches; fine sandy loam

Btk3—28 to 35 inches; loam

Btk4—35 to 41 inches; sandy loam

BCkb1—41 to 54 inches; fine sandy loam

BCkb2—54 to 73 inches; gravelly coarse sandy loam

Cb—73 to 99 inches; stratified loamy sand to loam

### ***Minor Components Composition***

Zia and similar soils: About 8 percent

Haozous and similar soils: About 5 percent

Urban land: About 2 percent

## **112—Riovista gravelly loamy sand, 0 to 1 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 6,900 feet (1,829 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Riovista and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Riovista soils**

*Landscape:* Valleys

*Landform:* Low flood plain steps on valley floors (fig. 11)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, and schist over residuum derived from granitic sandstone

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 25 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, galleta, oneseed juniper, sideoats grama, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 3 inches; gravelly loamy sand

C1—3 to 8 inches; gravelly sand

C2—8 to 16 inches; very gravelly coarse sand

C3—16 to 35 inches; extremely cobbly coarse sand

C4—35 to 53 inches; extremely gravelly loamy coarse sand

C5—53 to 61 inches; gravelly loamy sand

C6—61 to 95 inches; stratified gravelly coarse sand to loamy sand

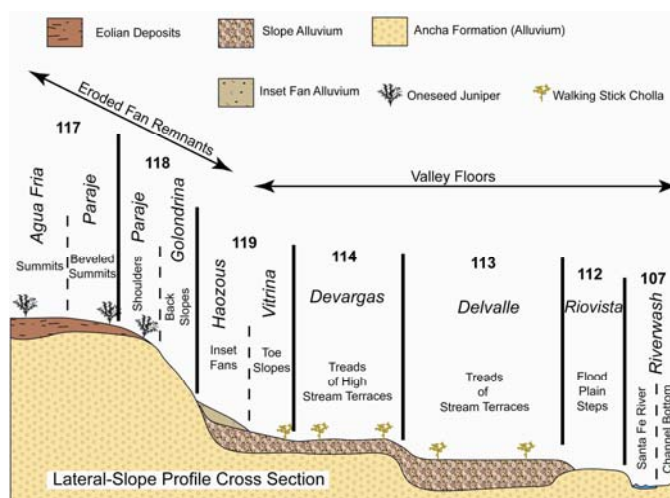
### ***Minor Components Composition***

Delvalle and similar soils: About 6 percent

Urban land: About 4 percent

Cuyamungue and similar soils: About 3 percent

Khapo and similar soils: About 2 percent



**Figure 11.—Cross-section diagram of landform and landform position for map units along the Santa Fe River in town and southwest of Santa Fe.**

## **113—Delvalle-Urban land complex, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,300 feet (1,646 to 2,225 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Delvalle and similar soils: 60 percent

Urban land: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Delvalle soils**

*Landscape:* Valleys

*Landform:* Stream terraces (fig. 11)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 3 percent subrounded cobbles; about 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.8 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; fine sandy loam

Bk1—3 to 10 inches; fine sandy loam

Bk2—10 to 19 inches; fine sandy loam

Bk3—19 to 34 inches; fine sandy loam

Bk4—34 to 54 inches; sandy loam

Bck1—54 to 63 inches; very gravelly sand

Bck2—63 to 72 inches; extremely gravelly coarse sand

C1—72 to 92 inches; very gravelly loamy coarse sand

C2—92 to 105 inches; sand

**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Delvalle soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.

*Landscape:* Valleys

*Landform:* Stream terraces

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth to restrictive feature:* 0 inches to strongly contrasting textural stratification

*Land capability subclass (nonirrigated):* 8s

***Minor Components Composition***

Devargas and similar soils: About 5 percent

*Slope:* 1 to 3 percent

Riovista and similar soils: About 3 percent

Dumps: About 2 percent

*Slope:* 0 to 8 percent

## **114—Devargas-Urban land complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,400 feet (1,646 to 2,256 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Devargas and similar soils: 50 percent

Urban land: 45 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Devargas soils**

*Landscape:* Valleys

*Landform:* High stream terraces (fig. 11)

*Position on landform:* Tread

*Parent material:* Alluvium derived from sandstone over alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 28 to 31 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 5.2 inches (low)

*Shrink-swell potential:* About 2.9 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt1—2 to 9 inches; loam

Bt2—9 to 17 inches; clay loam

Btk1—17 to 25 inches; clay loam

Btk2—25 to 30 inches; loam

Bk—30 to 33 inches; very gravelly coarse sandy loam

2BCk—33 to 42 inches; extremely gravelly loamy coarse sand

2C1—42 to 67 inches; extremely cobbly coarse sand

2C2—67 to 85 inches; extremely gravelly loamy coarse sand

2C3—85 to 94 inches; very gravelly coarse sand



**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Devargas soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.

*Landscape:* Valleys

*Landform:* High stream terraces

*Slope:* 0 to 3 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8s

***Minor Components Composition***

Delvalle and similar soils: About 3 percent

Panky and similar soils: About 1 percent

Dumps: About 1 percent

## **115—Panky-Urban land complex, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 6,900 feet (1,859 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Panky and similar soils: 55 percent

Urban land: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Panky soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, schist, loess, and volcanic ash

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.6 inches (high)

*Shrink-swell potential:* About 2.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 30 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, broom snakeweed, galleta, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt—2 to 9 inches; clay loam

Btk1—9 to 13 inches; clay loam

Btk2—13 to 17 inches; clay loam

Bk1—17 to 34 inches; loam

Bk2—34 to 45 inches; loam

Bkq1—45 to 64 inches; loam

Bkq2—64 to 92 inches; loam

Btyb—92 to 104 inches; loam

BCb—104 to 120 inches; loam

**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Panky soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8s

***Minor Components Composition***

Agua Fria and similar soils: About 3 percent

Khapo and similar soils: About 3 percent

Devargas and similar soils: About 2 percent

Dumps: About 2 percent

## **116—Arents-Urban land-Orthents complex, 1 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,600 feet (1,646 to 2,316 meters)

*Mean annual precipitation:* 9 to 15 inches (229 to 381 millimeters)

*Mean annual air temperature:* 46 to 52 degrees F (8.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Arents and similar soils: 50 percent

Urban land: 25 percent

Orthents and similar soils: 20 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Arents soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Toeslopes, backslopes

*Parent material:* Roadfill material derived from granite, gneiss, schist, sandstone, or siltstone

*Slope:* 1 to 45 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 20 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.1 inches (moderate)

*Shrink-swell potential:* About 2.2 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 7 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### ***Typical Profile***

ABkp—0 to 4 inches; gravelly loam

Btkp1—4 to 26 inches; gravelly loam

Btkp2—26 to 46 inches; gravelly loam

Btkp3—46 to 63 inches; loam

BCkp—63 to 90 inches; loam

#### **Urban land**

*Description:* Urban land consists of asphalt highway and frontage road lanes and the steel and concrete of bridges and overpasses. This Urban land is along major highway and road corridors such as Interstate 25 and 40, U.S. highway 285, NM highway 14, and NM highway 599.

*Landscape:* Fan piedmonts

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*Landform:* Eroded fan remnants

*Slope:* 1 to 15 percent

*Shape (down/across):* Linear/linear

*Depth to restrictive feature:* 0 inches to strongly contrasting textural stratification

*Land capability subclass (nonirrigated):* 8s

### **Orthents soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Backslopes, toeslopes

*Parent material:* Roadcut material derived from granite, gneiss, schist, loess, sandstone, or siltstone

*Slope:* 30 to 60 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 20 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Land capability subclass (nonirrigated):* 8e

### **Typical Profile**

C1—0 to 7 inches; very gravelly coarse sand

C2—7 to 15 inches; very gravelly coarse sand

C3—15 to 80 inches; stratified gravelly coarse sand to very gravelly coarse sand

### **Minor Components Composition**

Alire and similar soils: About 1 percent

Khapo and similar soils: About 1 percent

Panky and similar soils: About 1 percent

Predawn and similar soils: About 1 percent

Tanoan and similar soils: About 1 percent

## **117—Agua Fria-Paraje complex, 1 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,700 feet (1,707 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Agua Fria and similar soils: 60 percent

Paraje and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Agua Fria soils**

*Landscape:* Fan piedmonts (fig. 12)

*Landform:* Eroded fan remnants (fig. 11)

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 20 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change; 49 to 59 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 6.0 inches (moderate)

*Shrink-swell potential:* About 2.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 28 percent

*Gypsum average in horizon of maximum accumulation:* About 3 percent

*Salinity average in horizon of maximum accumulation:* About 10 mmhos/cm (moderately saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, threeawn, oneseed juniper, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

AE—0 to 3 inches; gravelly loam

Bt—3 to 7 inches; clay

Btk1—7 to 13 inches; gravelly clay loam

Btk2—13 to 19 inches; gravelly loam

Bk1—19 to 36 inches; gravelly loam

Bk2—36 to 53 inches; gravelly loam

Bky—53 to 61 inches; very gravelly coarse sandy loam

BCky1—61 to 69 inches; very gravelly loamy coarse sand

BCky2—69 to 88 inches; extremely gravelly coarse sand

C—88 to 100 inches; extremely gravelly loamy coarse sand

### **Paraje soils**

*Landscape:* Fan piedmonts (fig. 12)

*Landform:* Eroded fan remnants (fig. 11)

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 5 percent rounded cobbles; about 40 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 3.4 inches (low)

*Shrink-swell potential:* About 1.8 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

A—0 to 4 inches; very gravelly loam

Bt—4 to 9 inches; very gravelly clay loam

Btk—9 to 13 inches; very gravelly sandy clay loam

Bk1—13 to 22 inches; very gravelly sandy clay loam

Bk2—22 to 40 inches; extremely gravelly coarse sandy loam

Bck1—40 to 54 inches; extremely gravelly loamy coarse sand

Bck2—54 to 77 inches; extremely gravelly coarse sandy loam

Bck3—77 to 87 inches; extremely gravelly sandy clay loam

Bck4—87 to 99 inches; extremely gravelly coarse sandy loam

### **Minor Components Composition**

Panky and similar soils: About 5 percent

Golondrina and similar soils: About 3 percent

Urban land: About 2 percent



**Figure 12.—An area of Agua Fria-Paraje complex, 1 to 8 percent slopes. Roadcut shows the profile of the Agua Fria soils. The upper profile shows very few rock fragments underlain by very gravelly and cobbly alluvium.**



## **118—Golondrina-Paraje complex, 8 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 7,000 feet (1,768 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Golondrina and similar soils: 50 percent

Paraje and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Golondrina soils**

*Landscape:* Fan piedmonts (fig. 13)

*Landform:* Eroded fan remnants (fig. 11)

*Position on landform:* Backslopes

*Parent material:* Colluvium and alluvium derived from granite, gneiss, schist, and loess

*Slope:* 15 to 45 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 10 percent rounded cobbles; about 55 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, sideoats grama, New Mexico feathergrass, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6e

### ***Typical Profile***

A—0 to 4 inches; extremely gravelly coarse sandy loam

Btk1—4 to 8 inches; very gravelly sandy clay loam

Btk2—8 to 17 inches; very gravelly coarse sandy loam

Btk3—17 to 31 inches; extremely gravelly coarse sandy loam

Bck—31 to 42 inches; very gravelly coarse sandy loam

Bck1—42 to 53 inches; extremely gravelly coarse sandy loam

Bck2—53 to 67 inches; extremely gravelly coarse sandy loam

C—67 to 84 inches; extremely gravelly coarse sandy loam

### **Paraje soils**

*Landscape:* Fan piedmonts (fig. 13)

*Landform:* Eroded fan remnants (fig. 11)

*Position on landform:* Shoulders

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 8 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 5 percent rounded cobbles; about 50 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 1.6 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

A—0 to 3 inches; very gravelly loam

Bt—3 to 6 inches; very gravelly clay loam

Btk—6 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 21 inches; very gravelly sandy clay loam

Bk2—21 to 37 inches; very gravelly coarse sandy loam

Bck1—37 to 47 inches; extremely gravelly loamy coarse sand

Bck2—47 to 62 inches; extremely gravelly loamy coarse sand

Bck3—62 to 79 inches; extremely gravelly coarse sandy loam

C—79 to 94 inches; very gravelly sandy clay loam

### **Minor Components Composition**

Paraje and similar soils: About 5 percent

Agua Fria and similar soils: About 4 percent

Urban land: About 1 percent



**Figure 13.—An area of Golondrina-Paraje complex, 8 to 45 percent slopes is in the background. An area of Vitrina-Haozous complex, 5 to 15 percent slopes, flooded is in the foreground. Vitrina soils are closest with Haozous soils on an inset fan directly beyond the Vitrina soils. Golondrina soils begin where the slope becomes steep.**

## **119—Vitrina-Haozous complex, 5 to 15 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,600 feet (1,646 to 2,012 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Vitrina and similar soils: 50 percent

Haozous and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Vitrina soils**

*Landscape:* Fan piedmonts (fig. 13)

*Landform:* Eroded fan remnants (fig. 11)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 20 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, black grama, galleta, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; gravelly coarse sandy loam

Bt1—3 to 11 inches; gravelly sandy loam

Bt2—11 to 16 inches; gravelly coarse sandy loam

Btk—16 to 26 inches; gravelly coarse sandy loam

Bk—26 to 41 inches; gravelly coarse sandy loam

BCK—41 to 53 inches; gravelly sandy loam

Bkb—53 to 61 inches; gravelly coarse sandy loam

BCKb1—61 to 75 inches; very gravelly coarse sandy loam

BCKb2—75 to 98 inches; gravelly coarse sandy loam

Cb—98 to 110 inches; gravelly sandy loam

### **Haozous soils**

*Landscape:* Fan piedmonts (fig. 13)

*Landform:* Inset fans on eroded fan remnants (fig. 11)

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 5 percent rounded cobbles; about 40 percent rounded gravels

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, black grama, galleta, oneseed juniper

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

AC1—0 to 1 inch; very gravelly coarse sandy loam

AC2—1 inch to 8 inches; very gravelly coarse sand

AB—8 to 14 inches; gravelly sandy loam

Bw1—14 to 27 inches; gravelly coarse sandy loam

Bw2—27 to 34 inches; gravelly coarse sandy loam

Bw3—34 to 44 inches; gravelly coarse sandy loam

Bk1—44 to 48 inches; gravelly coarse sandy loam

Bk2—48 to 57 inches; very gravelly coarse sandy loam

BCK1—57 to 89 inches; stratified gravelly loamy coarse sand to very gravelly coarse sand

BCK2—89 to 120 inches; stratified very gravelly loamy coarse sand to gravelly coarse sandy loam

### **Minor Components Composition**

Riverwash: About 3 percent

Vitrina and similar soils: About 3 percent

Chupe and similar soils: About 2 percent

Golondrina and similar soils: About 1 percent

Wet spot: About 1 percent

## **120—Quarteles-Rock outcrop complex, 25 to 90 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,900 feet (1,676 to 2,103 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Quarteles and similar soils: 70 percent

Rock outcrop: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Quarteles soils**

*Landscape:* Piedmont slopes (fig. 14)

*Landform:* Ridges, hills (fig. 15)

*Position on landform:* Backslopes

*Parent material:* Colluvium and residuum derived from micaceous sandstone, siltstone, mudstone, and fanglomerate

*Slope:* 25 to 90 percent

*Shape (down/across):* Linear, convex/convex

*Surface fragments:* About 25 percent rounded medium and coarse gravel

*Depth class:* Very shallow

*Depth to restrictive feature:* 4 to 10 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandstone Hills

*Potential native vegetation:* sideoats grama, blue grama, Indian ricegrass, mountain mahogany, oneseed juniper

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 2 inches; gravelly loam

2C1—2 to 5 inches; paragravelly loam

2C2—5 to 7 inches; very paragravelly loam

2Cr—7 to 17 inches; cemented bedrock

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed sandstone or siltstone bedrock. It occurs as ledges or cliffs intermingled with the Quarteles soils.

*Landscape:* Piedmont slopes (fig. 14)

*Landform:* Hills, ridges (fig. 15)

Parent material: Sandstone and siltstone  
 Slope: 50 to 150 percent  
 Shape (down/across): Convex/convex  
 Depth to restrictive feature: At surface, bedrock, lithic  
 Runoff class: Very high  
 Land capability subclass (nonirrigated): 8

#### Minor Components Composition

Jaconita and similar soils: About 4 percent  
 Ojito and similar soils: About 3 percent  
 Xenmack and similar soils: About 2 percent  
 Chupe and similar soils: About 1 percent



Figure 14.—An area of Quarteles-Rock outcrop complex, 25 to 90 percent slopes. The Quarteles soils are on areas that have vegetation. Rock outcrop areas are devoid of vegetation.

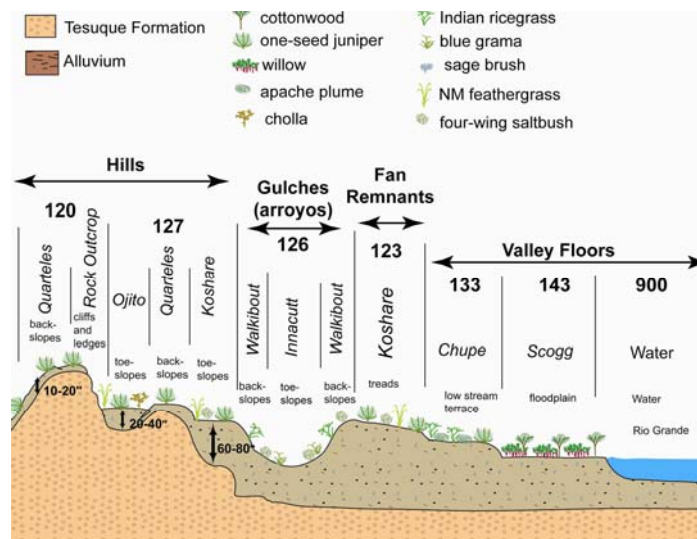


Figure 15.—Cross-section diagram of landform and landform position for map units north of Santa Fe.

## **121—El Rancho silt loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,700 feet (1,676 to 2,042 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

El Rancho and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **El Rancho soils**

*Landscape:* Piedmont slopes (fig. 16)

*Landform:* Fan remnants (fig. 17)

*Position on landform:* Tread

*Parent material:* Alluvium derived from micaceous siltstone, sandstone, and mudstone

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 3 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.9 inches (high)

*Shrink-swell potential:* About 4.2 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; silt loam

Bw1—3 to 11 inches; silt loam

Bw2—11 to 24 inches; silt loam

Bw3—24 to 38 inches; silt loam

BC—38 to 53 inches; silt loam

C1—53 to 85 inches; silt loam

C2—85 to 120 inches; silty clay loam

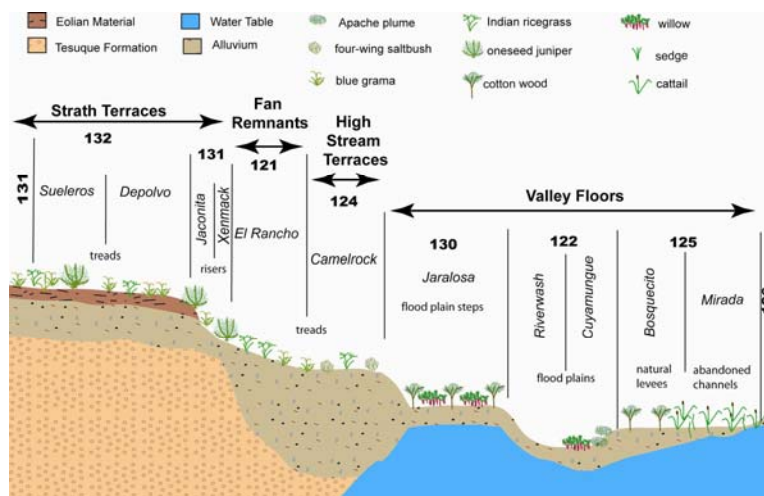


### ***Minor Components Composition***

Koshare and similar soils: About 5 percent  
Walkibout and similar soils: About 4 percent  
Urban land: About 3 percent  
Chupe and similar soils: About 3 percent



**Figure 16.—An area of El Rancho silt loam, 1 to 3 percent slopes is in the foreground. An area of Quarteles-Rock outcrop complex, 25 to 90 percent slopes is in the background.**



**Figure 17.—Cross-section diagram of landform and landform position for map units north of Santa Fe, mostly along or adjacent to the Santa Cruz, Tesuque, Pojoaque, and Nambe River systems, and the Rio Grande.**

## **122—Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,500 feet (1,646 to 2,286 meters)

*Mean annual precipitation:* 9 to 14 inches (229 to 356 millimeters)

*Mean annual air temperature:* 47 to 52 degrees F (8.3 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Cuyamungue and similar soils: 60 percent

Riverwash: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cuyamungue soils**

*Landscape:* Valleys (fig. 18 and fig. 19)

*Landform:* Flood plains on valley floors (fig. 17)

*Parent material:* Alluvium derived from granite, gneiss, schist, and granitic sandstone

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 35 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Populus fremontii/Salix exigua-Salix/Carex

*Potential native vegetation:* Bigelow's rubber rabbitbrush, willow, Fremont cottonwood

*Land capability subclass (nonirrigated):* 4w

### ***Typical Profile***

AC—0 to 3 inches; very gravelly coarse sand

C1—3 to 17 inches; stratified gravelly coarse sand to very gravelly coarse sand

C2—17 to 24 inches; stratified gravelly coarse sand to very gravelly coarse sand

C3—24 to 35 inches; very gravelly coarse sand

C4—35 to 58 inches; stratified gravelly coarse sand to extremely gravelly coarse sand

C5—58 to 86 inches; stratified very gravelly coarse sand to extremely gravelly coarse sand

C6—86 to 100 inches; extremely gravelly loamy coarse sand

### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Cuyamungue soil.

*Landscape:* Valleys (fig. 18 and fig. 19)

*Landform:* Flood plains on valley floors (fig. 17)

*Parent material:* Alluvium derived from mixed

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### **Minor Components Composition**

Zia and similar soils: About 4 percent

Bosquecito and similar soils: About 3 percent

Mirada and similar soils: About 2 percent

Wet spot: About 1 percent



**Figure 18.—An area of Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded, in the Santa Fe Canyon, southwest of Santa Fe.**



**Figure 19.—An area of Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded. Riverwash on the left. The Cuyamungue soils are in the middle. Trees are on an area of Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded.**

## **123—Koshare very fine sandy loam, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,800 feet (1,646 to 2,073 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Koshare and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Koshare soils**

*Landscape:* Piedmont slopes

*Landform:* Fan remnants (fig. 15)

*Position on landform:* Tread

*Parent material:* Alluvium derived from micaceous sandstone and siltstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.0 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's  
rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; very fine sandy loam

Bk1—3 to 19 inches; fine sandy loam

Bk2—19 to 30 inches; fine sandy loam

Bk3—30 to 42 inches; fine sandy loam

Bck1—42 to 55 inches; very fine sandy loam

Bck2—55 to 72 inches; fine sandy loam

Bck3—72 to 83 inches; very fine sandy loam

2Bck4—83 to 96 inches; gravelly coarse sand

3Bck5—96 to 121 inches; very fine sandy loam

***Minor Components Composition***

El Rancho and similar soils: About 6 percent

Innacutt and similar soils: About 4 percent

Walkibout and similar soils: About 3 percent

Urban land: About 2 percent

## **124—Camelrock silty clay loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,500 feet (1,676 to 1,981 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Camelrock and similar soils: 80 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Camelrock soils**

*Landscape:* Valleys (fig. 20)

*Landform:* High stream terraces (fig. 17)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, schist, micaceous sandstone, siltstone, and mudstone

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 9.7 inches (high)

*Shrink-swell potential:* About 5.2 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Clayey Bottomland

*Potential native vegetation:* western wheatgrass, blue grama, fourwing saltbush, galleta

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; silty clay loam

Bw—3 to 7 inches; silty clay loam

Bss—7 to 14 inches; silty clay

Bkssy1—14 to 24 inches; silty clay

Bkssy2—24 to 29 inches; silty clay

BKky1—29 to 41 inches; stratified clay loam to very fine sandy loam

BKky2—41 to 55 inches; stratified loam to silty clay loam

BKky3—55 to 71 inches; clay

C1—71 to 98 inches; stratified loam to silty clay loam

C2—98 to 120 inches; stratified fine sandy loam to silty clay

***Minor Components Composition***

El Rancho and similar soils: About 8 percent

Walkibout and similar soils: About 4 percent

Urban land: About 3 percent



**Figure 20.—An area of Camelrock silty clay loam, 0 to 2 percent slopes.  
The very flat Camelrock soils are in an area close to Pojoaque.**



## **125—Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,600 feet (1,676 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Mirada and similar soils: 55 percent

Bosquecito and similar soils: 40 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Mirada soils**

*Landscape:* Valleys (fig. 19 and fig. 21)

*Landform:* Abandoned channels on valley floors (fig. 17)

*Parent material:* Alluvium derived from micaceous sandstone, siltstone, granite, gneiss, and schist

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Very poorly drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.3 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Ponding hazard:* Frequent

*Seasonal high water table depth:* About 0 to 5 inches

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Marshy

*Potential native vegetation:* rabbitfootgrass, bluejoint, rush, sedge, western wheatgrass

*Land capability subclass (nonirrigated):* 5c

### ***Typical Profile***

A—0 to 2 inches; silt loam

ACg—2 to 9 inches; silt loam

Cg1—9 to 25 inches; stratified silt loam to fine sandy loam

Cg2—25 to 34 inches; stratified very fine sandy loam to sandy loam

Cg3—34 to 43 inches; stratified fine sandy loam to loamy sand

Cg4—43 to 58 inches; stratified gravelly coarse sand to gravelly coarse sand

Cg5—58 to 80 inches; stratified gravelly coarse sand to very gravelly coarse sand

### **Bosquecito soils**

*Landscape:* Valleys (fig. 19 and fig. 21)

*Landform:* Natural levees flood plains on valley floors (fig. 17)

*Parent material:* Alluvium derived from micaceous sandstone, siltstone, granite, gneiss, and schist

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.5 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Seasonal high water table depth:* About 24 to 31 inches

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 7 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 4 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* *Populus fremontii*/*Salix exigua*-*Salix*/*Carex*

*Potential native vegetation:* Kentucky bluegrass, cottonwood, western wheatgrass

*Land capability subclass (nonirrigated):* 2w

#### **Typical Profile**

A—0 to 1 inch; very fine sandy loam

AC1—1 inch to 5 inches; loamy very fine sand

AC2—5 to 10 inches; loamy sand

C1—10 to 16 inches; fine sandy loam

C2—16 to 26 inches; fine sandy loam

Cg1—26 to 33 inches; fine sandy loam

Cg2—33 to 42 inches; stratified fine sandy loam to loamy sand

Cg3—42 to 51 inches; stratified very fine sandy loam to loamy sand

Cg4—51 to 64 inches; stratified gravelly coarse sand to loamy very fine sand

C'—64 to 84 inches; stratified gravelly coarse sand to very gravelly coarse sand

#### **Minor Components Composition**

Cuyamungue and similar soils: About 2 percent

Jaralosa and similar soils: About 2 percent

Scogg and similar soils: About 1 percent



**Figure 21.—An area of Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded. The Mirada soils are in the foreground with an abundant growth of sedges and cattails. The Bosquecito soils are in the background covered with trees.**

## **126—Walkibout-Innacutt complex, 2 to 80 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,100 feet (1,646 to 2,164 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Walkibout and similar soils: 55 percent

Innacutt and similar soils: 25 percent

Minor components: 20 percent

### ***Component Descriptions***

#### **Walkibout soils**

*Landscape:* Piedmont slopes (fig. 22)

*Landform:* Gulches (fig. 15)

*Position on landform:* Backslopes

*Parent material:* Colluvium and alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate

*Slope:* 25 to 80 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 5 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 43 to 67 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.1 inches (moderate)

*Shrink-swell potential:* About 2.4 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Limy

*Potential native vegetation:* western wheatgrass, galleta, winterfat, Indian ricegrass, fourwing saltbush

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 2 inches; loam

B<sub>Ck</sub>—2 to 7 inches; fine sandy loam

C<sub>1</sub>—7 to 18 inches; very fine sandy loam

C<sub>2</sub>—18 to 25 inches; silt loam

C<sub>3</sub>—25 to 42 inches; silt loam

C4—42 to 49 inches; stratified fine sandy loam to gravelly coarse sand  
C5—49 to 55 inches; very fine sandy loam  
C6—55 to 72 inches; stratified loamy fine sand to gravelly coarse sand  
C7—72 to 87 inches; stratified very fine sandy loam to loamy very fine sand  
C8—87 to 120 inches; stratified silt loam to very fine sandy loam

**Innacutt soils**

*Landscape:* Piedmont slopes (fig. 22)  
*Landform:* Inset fans on gulches (fig. 15)  
*Position on landform:* Toeslopes  
*Parent material:* Alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate  
*Slope:* 2 to 8 percent  
*Shape (down/across):* Linear/linear  
*Surface fragments:* About 5 percent rounded medium and coarse gravel  
*Depth class:* Very deep  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 7.1 inches (moderate)  
*Shrink-swell potential:* About 1.7 percent (low)  
*Flooding hazard:* Frequent  
*Runoff class:* Low  
*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)  
*Ecological site:* Deep Sand  
*Potential native vegetation:* Indian ricegrass, blue grama, sand dropseed, galleta  
*Land capability subclass (nonirrigated):* 7c

**Typical Profile**

AC1—0 to 2 inches; fine sandy loam  
AC2—2 to 6 inches; very fine sandy loam  
C1—6 to 18 inches; stratified fine sandy loam to very fine sandy loam  
C2—18 to 24 inches; fine sandy loam  
C3—24 to 33 inches; fine sandy loam  
C4—33 to 47 inches; stratified very fine sandy loam to loamy very fine sand  
C5—47 to 53 inches; very gravelly coarse sand  
2C6—53 to 98 inches; stratified very fine sandy loam to silt loam  
2C7—98 to 120 inches; stratified very fine sandy loam to fine sandy loam

**Minor Components Composition**

Koshare and similar soils: About 5 percent  
Chupe and similar soils: About 4 percent  
Quarteles and similar soils: About 4 percent  
El Rancho and similar soils: About 3 percent  
Riverwash: About 2 percent  
Urban land: About 2 percent



**Figure 22.—An area of Walkibout-Innacutt complex, 2 to 80 percent slopes, flooded. The Walkibout soils are on steep slopes. The Innacutt soils are on flood plains. An inclusion of Riverwash is in the right center.**

## **127—Ojito-Koshare-Quarteles complex, 5 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,600 feet (1,646 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Ojito and similar soils: 40 percent

Koshare and similar soils: 30 percent

Quarteles and similar soils: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Ojito soils**

*Landscape:* Piedmont slopes

*Landform:* Hills (fig. 15)

*Position on landform:* Shoulders, footslopes

*Parent material:* Eolian material and slope alluvium derived from micaceous sandstone and siltstone over residuum weathered from micaceous sandstone

*Slope:* 5 to 25 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Sandy Slopes

*Potential native vegetation:* Indian ricegrass, New Mexico feathergrass, sand dropseed

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; loamy very fine sand

Bk1—3 to 10 inches; loamy very fine sand

Bk2—10 to 18 inches; loamy very fine sand

2BCK1—18 to 25 inches; very fine sandy loam

3BCK2—25 to 35 inches; very paragravelly very fine sand

3Cr—35 to 45 inches; cemented bedrock

### **Koshare soils**

*Landscape:* Piedmont slopes

*Landform:* Hills (fig. 15)

*Position on landform:* Toeslopes

*Parent material:* Eolian material and slope alluvium derived from sandstone and siltstone over residuum weathered from micaceous sandstone, eolian material and slope alluvium derived from micaceous sandstone and siltstone over residuum weathered from micaceous sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.4 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6e

#### **Typical Profile**

A—0 to 3 inches; very fine sandy loam

Bk1—3 to 15 inches; very fine sandy loam

Bk2—15 to 29 inches; very fine sandy loam

Bk3—29 to 41 inches; very fine sandy loam

BCK—41 to 50 inches; very fine sandy loam

2BCK1—50 to 59 inches; paragravelly loamy very fine sand

2BCK2—59 to 67 inches; very paragravelly loamy very fine sand

2Cr—67 to 77 inches; cemented bedrock

### **Quarteles soils**

*Landscape:* Piedmont slopes

*Landform:* Hills (fig. 15)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from sandstone, siltstone, and mudstone over residuum weathered from micaceous sandstone and siltstone

*Slope:* 25 to 50 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent rounded gravel; about 5 percent subangular channers

*Depth class:* Very shallow

*Depth to restrictive feature:* 4 to 10 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)



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*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandstone Hills

*Potential native vegetation:* sideoats grama, blue grama, Indian ricegrass, mountain mahogany, oneseed juniper

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; gravelly very fine sandy loam

2C1—3 to 6 inches; very paragravelly very fine sandy loam

2C2—6 to 9 inches; extremely paragravelly very fine sandy loam

2Cr—9 to 19 inches; cemented bedrock

### ***Minor Components Composition***

Rock outcrop: About 4 percent

Urban land: About 2 percent

Walkibout and similar soils: About 2 percent

Riverwash: About 1 percent

Innacutt and similar soils: About 1 percent

## **128—Koshare-Urban land complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,500 feet (1,676 to 1,981 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Koshare and similar soils: 55 percent

Urban land: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Koshare soils**

*Landscape:* Piedmont slopes

*Landform:* Fan remnants

*Position on landform:* Tread

*Parent material:* Alluvium derived from micaceous sandstone and siltstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.0 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's  
rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; very fine sandy loam

Bk1—3 to 19 inches; fine sandy loam

Bk2—19 to 30 inches; fine sandy loam

Bk3—30 to 42 inches; fine sandy loam

Bck1—42 to 55 inches; very fine sandy loam

Bck2—55 to 72 inches; fine sandy loam

Bck3—72 to 83 inches; very fine sandy loam

2Bck4—83 to 96 inches; gravelly coarse sand

3Bck5—96 to 121 inches; very fine sandy loam

**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in and adjacent to communities in northern Santa Fe County such as Cuyamungue, El Rancho, Jacona, Jaconita, Nambe, Pojoaque, Tesuque Pueblo, and their surrounding areas. It is intermingled with Koshare soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.

*Landscape:* Piedmont slopes

*Landform:* Fan remnants

*Slope:* 2 to 6 percent

*Shape (down/across):* Linear/linear

***Minor Components Composition***

El Rancho and similar soils: About 5 percent

Innacutt and similar soils: About 3 percent

Walkibout and similar soils: About 2 percent

## **129—El Rancho-Urban land complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,500 feet (1,707 to 1,981 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

El Rancho and similar soils: 55 percent

Urban land: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **El Rancho soils**

*Landscape:* Piedmont slopes

*Landform:* Fan remnants

*Position on landform:* Tread

*Parent material:* Alluvium derived from micaceous siltstone, sandstone, and mudstone

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 3 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.9 inches (high)

*Shrink-swell potential:* About 4.2 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; silt loam

Bw1—3 to 11 inches; silt loam

Bw2—11 to 24 inches; silt loam

Bw3—24 to 38 inches; silt loam

BC—38 to 53 inches; silt loam

C1—53 to 85 inches; silt loam

C2—85 to 120 inches; silty clay loam

**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in and adjacent to communities in northern Santa Fe County such as Cuyamungue, El Rancho, Jacona, Jaconita, Nambe, Pojoaque, Tesuque Pueblo, and their surrounding areas. It is intermingled with El Rancho soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.

*Landscape:* Piedmont slopes

*Landform:* Fan remnants

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

***Minor Components Composition***

Koshare and similar soils: About 6 percent

Walkibout and similar soils: About 3 percent

Chupe and similar soils: About 1 percent

## **130—Jaralosa very fine sandy loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,900 feet (1,646 to 2,103 meters)

*Mean annual precipitation:* 9 to 14 inches (229 to 356 millimeters)

*Mean annual air temperature:* 47 to 52 degrees F (8.3 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Jaralosa and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Jaralosa soils**

*Landscape:* Valleys (fig. 23)

*Landform:* Flood plain steps on valley floors (fig. 17)

*Position on landform:* Tread

*Parent material:* Alluvium derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, or schist

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Depth to restrictive feature:* 20 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Moderately well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* *Populus fremontii*/*Salix exigua*-*Salix*/*Carex*

*Potential native vegetation:* willow, cottonwood, sedge

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 1 inch; very fine sandy loam

AC1—1 inch to 6 inches; loamy very fine sand

AC2—6 to 10 inches; very fine sandy loam

ACnz—10 to 16 inches; very fine sandy loam

Cnz1—16 to 22 inches; loamy very fine sand

Cnz2—22 to 35 inches; stratified very fine sandy loam to loamy very fine sand

2C1—35 to 42 inches; gravelly sand, gravelly coarse sand

2C2—42 to 53 inches; stratified very gravelly coarse sand to very gravelly coarse sand

2C3—53 to 84 inches; very gravelly coarse sand

***Minor Components Composition***

Bosquecito and similar soils: About 6 percent

Innacutt and similar soils: About 4 percent

Cuyamungue and similar soils: About 3 percent

Urban land: About 2 percent



**Figure 23.—An area of Jaralosa very fine sandy loam, 0 to 2 percent slopes, flooded.**

## **131—Jaconita-Xenmack complex, 25 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,600 feet (1,646 to 2,012 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Jaconita and similar soils: 45 percent

Xenmack and similar soils: 45 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Jaconita soils**

*Landscape:* Piedmont slopes

*Landform:* Upper strath terraces (fig. 17)

*Position on landform:* Riser

*Parent material:* Colluvium and slope alluvium derived from granite, gneiss, schist, and micaceous sandstone

*Slope:* 25 to 60 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 50 percent rounded gravel; about 5 percent rounded cobbles

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.1 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 7 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

ABk—0 to 2 inches; very gravelly coarse sandy loam

Bk1—2 to 5 inches; very gravelly coarse sandy loam

Bk2—5 to 10 inches; very gravelly loamy coarse sand

BCK1—10 to 22 inches; very gravelly coarse sand

BCK2—22 to 42 inches; extremely gravelly coarse sand

C1—42 to 65 inches; extremely gravelly coarse sand

2C2—65 to 77 inches; very fine sandy loam



2C3—77 to 99 inches; loam  
2C4—99 to 108 inches; loamy fine sand  
2C5—108 to 120 inches; loam

**Xenmack soils**

*Landscape:* Piedmont slopes  
*Landform:* Lower strath terraces (fig. 17)  
*Position on landform:* Riser  
*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum derived from sandstone and siltstone  
*Slope:* 25 to 60 percent  
*Shape (down/across):* Concave/linear  
*Surface fragments:* About 50 percent rounded gravel; about 15 percent rounded cobbles  
*Depth class:* Moderately deep  
*Depth to restrictive feature:* 20 to 39 inches to bedrock, paralithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 4.6 inches (low)  
*Shrink-swell potential:* About 2.0 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Gravelly  
*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7e

**Typical Profile**

ABk—0 to 2 inches; extremely gravelly sandy loam  
Bk1—2 to 7 inches; very gravelly sandy loam  
Bk2—7 to 16 inches; gravelly loam  
Bk3—16 to 24 inches; gravelly loam  
2Bck1—24 to 29 inches; paragravelly clay loam  
2Bck2—29 to 37 inches; very paragravelly loam  
2Cr—37 to 47 inches; cemented bedrock

**Minor Components Composition**

Quarteles and similar soils: About 5 percent  
Zozobra and similar soils: About 3 percent  
Depolvo and similar soils: About 2 percent

## **132—Depolvo-Sueleros complex, 2 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,500 feet (1,676 to 1,981 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Depolvo and similar soils: 45 percent

Sueleros and similar soils: 40 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Depolvo soils**

*Landscape:* Piedmont slopes (fig. 24)

*Landform:* Higher portions on strath terraces (fig. 17)

*Position on landform:* Tread

*Parent material:* Loess derived from micaceous sandstone and siltstone

*Slope:* 2 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 9.4 inches (high)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 18 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 6 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; very fine sandy loam

Btk1—3 to 9 inches; loam

Btk2—9 to 21 inches; loam

Btk3—21 to 38 inches; loam

Bk1—38 to 48 inches; loam

Bk2—48 to 58 inches; loam

Btkb—58 to 79 inches; fine sandy loam

Bkb1—79 to 93 inches; sandy loam

Bkb2—93 to 103 inches; fine sandy loam

Bkb3—103 to 109 inches; gravelly sandy loam

**Sueleros soils**

*Landscape:* Piedmont slopes (fig. 24)

*Landform:* Beveled, lower portions on strath terraces (fig. 17)

*Position on landform:* Tread

*Parent material:* Loess derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, and schist

*Slope:* 2 to 15 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 10 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 6 inches to natric

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 20 mmhos/cm (strongly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 45 (strongly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

**Typical Profile**

A—0 to 3 inches; very fine sandy loam

Btkn1—3 to 6 inches; loam

Btkn2—6 to 14 inches; loam

Btkn3—14 to 26 inches; loam

Bkn—26 to 37 inches; very gravelly sandy loam

2Bk1—37 to 44 inches; very gravelly coarse sand

2Bk2—44 to 54 inches; very gravelly coarse sand

3BCK1—54 to 70 inches; loam

3BCK2—70 to 92 inches; very fine sandy loam

3C—92 to 120 inches; very fine sandy loam

**Minor Components Composition**

Jaconita and similar soils: About 7 percent

Xenmack and similar soils: About 5 percent

Ojito and similar soils: About 3 percent



**Figure 24.—An area of Depolvo-Sueleros complex, 2 to 15 percent slopes. The Sangre de Cristo Mountains are in the background.**

## **133—Chupe fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,300 to 6,600 feet (1,615 to 2,012 meters)

*Mean annual precipitation:* 9 to 13 inches (229 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Chupe and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Chupe soils**

*Landscape:* Valleys (fig. 25)

*Landform:* Low stream terraces on valley floors (fig. 15)

*Parent material:* Alluvium derived from granite and quartzite

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* sand dropseed, black grama, blue grama, Bigelow's  
rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; fine sandy loam

C1—4 to 8 inches; sand

C2—8 to 23 inches; gravelly coarse sand

C3—23 to 41 inches; gravelly coarse sand

C4—41 to 55 inches; gravelly coarse sand

C5—55 to 76 inches; gravelly coarse sand

C6—76 to 94 inches; very gravelly coarse sand

### ***Minor Components Composition***

Metate and similar soils: About 5 percent

Scogg and similar soils: About 5 percent



**Figure 25.—An area of Chupe fine sandy loam, 1 to 3 percent slopes with Vanto soils at the mouth of Canon de los Frijoles. An area of Ildefonso-Rock outcrop-Rubble land complex, 30 to 70 percent slopes is in the background.**

## **134—Bosquecito fine sandy loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,200 feet (1,707 to 1,890 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Bosquecito and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Bosquecito soils**

*Landscape:* Valleys

*Landform:* Flood plain steps on valley floors

*Parent material:* Alluvium derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, or schist

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.0 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Populus fremontii/Salix exigua-Salix/Carex

*Potential native vegetation:* cottonwood, western wheatgrass, willow

*Land capability subclass (nonirrigated):* 2c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

AC1—2 to 5 inches; very fine sandy loam

AC2—5 to 8 inches; loamy sand

C1—8 to 12 inches; fine sandy loam

C2—12 to 19 inches; fine sandy loam

Cg1—19 to 29 inches; sandy loam

Cg2—29 to 42 inches; gravelly coarse sand

Cg3—42 to 56 inches; very gravelly coarse sand

C'—56 to 82 inches; very gravelly coarse sand

***Minor Components Composition***

Mirada and similar soils: About 4 percent

Jaralosa and similar soils: About 3 percent

Cuyamungue and similar soils: About 3 percent



## **135—Tsinat gravelly loam, 1 to 6 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,800 feet (1,768 to 2,073 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Tsinat and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Tsinat soils**

*Landscape:* Lava fields

*Landform:* Interfluves on undulating plateaus (fig. 9)

*Position on landform:* Beveled summits

*Parent material:* Eolian material and alluvium derived from basalt and volcanic ash

*Slope:* 1 to 6 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 5 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to duripan and/or petrocalcic; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.9 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 40 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Cinder

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; gravelly loam

Btk1—2 to 9 inches; loam

Btk2—9 to 14 inches; cobbly clay loam

Btk3—14 to 21 inches; cobbly clay loam

Bk—21 to 28 inches; gravelly loam

Bkqm—28 to 45 inches; cemented material

B'k—45 to 54 inches; gravelly sandy loam

2R—54 to 64 inches; cemented bedrock

***Minor Components Composition***

Calabasas and similar soils: About 4 percent

Medrano and similar soils: About 3 percent

Churipa and similar soils: About 3 percent

## **136—Churipa very cobbly sandy loam, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 6,700 feet (1,737 to 2,042 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Churipa and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Churipa soils**

*Landscape:* Lava fields

*Landform:* Interfluvies on undulating plateaus (fig. 9)

*Position on landform:* Shoulders

*Parent material:* Alluvium derived from basalt, volcanic ash, and scoria (cinders)

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 2 percent subangular stones; about 25 percent subangular cobbles; about 15 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to petrocalcic and/or duripan; 20 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 40 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Shallow

*Potential native vegetation:* blue grama, sideoats grama, little bluestem, galleta, oneseed juniper, skunkbush sumac

*Land capability subclass (nonirrigated):* 6e

### ***Typical Profile***

A—0 to 1 inch; very cobbly loam

Bt1—1 inch to 6 inches; loam

Bt2—6 to 9 inches; clay loam

Btk—9 to 13 inches; cobbly loam

Bk—13 to 17 inches; cobbly loam

Bkqm—17 to 30 inches; cemented material

B'k—30 to 36 inches; extremely cobbly loamy sand

2R—36 to 46 inches; cemented bedrock

***Minor Components Composition***

Tsinat and similar soils: About 4 percent  
Medrano and similar soils: About 3 percent  
Parida and similar soils: About 2 percent  
Rock outcrop: About 1 percent

## **137—Medrano extremely gravelly loam, 5 to 65 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 6,900 feet (1,737 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Medrano and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Medrano soils**

*Landscape:* Lava fields (fig. 26)

*Landform:* Cinder cones (fig. 9)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from volcanic ash over residuum weathered from scoria (cinders)

*Slope:* 5 to 65 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* Less than 1 percent subrounded stones; about 10 percent subrounded cobbles; about 55 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to duripan

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 55 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 6 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, black grama, New Mexico feathergrass, galleta, sideoats grama, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; extremely gravelly loam

Bt1—3 to 7 inches; very gravelly loam

Bt2—7 to 10 inches; very gravelly clay loam

Btk—10 to 14 inches; very gravelly clay loam

Bk—14 to 19 inches; very gravelly loam

Bkqm—19 to 30 inches; cemented material

BCK1—30 to 49 inches; extremely gravelly cinders

BCK2—49 to 80 inches; extremely gravelly cinders

***Minor Components Composition***

Churipa and similar soils: About 4 percent

Tsinat and similar soils: About 3 percent

Rock outcrop: About 3 percent



**Figure 26.—A Cinder mine in an area of Medrano extremely gravelly loam, 5 to 65 percent slopes. The Medrano soils are exposed by the pit. White duripan is evident in the upper part of the profile.**

## **138—Andanada very gravelly loam, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,700 feet (1,768 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Andanada and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Andanada soils**

*Landscape:* Lava plateaus

*Landform:* Undulating mesas, plateaus (fig. 27)

*Position on landform:* Shoulders

*Parent material:* Slope alluvium derived from basalt

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 35 percent subangular gravel; about 10 percent subangular cobbles; less than 1 percent subangular stones

*Depth class:* Very shallow

*Depth to restrictive feature:* 2 to 10 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 0.8 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* New Mexico feathergrass, black grama, sideoats grama, blue grama, oneseed juniper

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

Ak—0 to 3 inches; very gravelly loam

Bk—3 to 9 inches; very gravelly loam

2R—9 to 19 inches; cemented bedrock

### ***Minor Components Composition***

Chiminet and similar soils: About 5 percent

Rock outcrop: About 5 percent

## Soil Survey of Santa Fe County Area, New Mexico

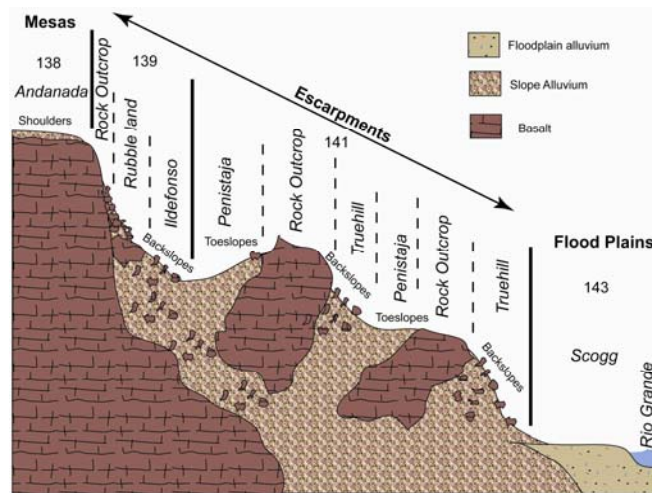


Figure 27.—Cross-section diagram of landform and landform position for map units in White Rock Canyon along the Rio Grande.



## **139—Ildefonso-Rock outcrop-Rubble land complex, 30 to 70 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,700 feet (1,676 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Ildefonso and similar soils: 55 percent

Rock outcrop: 20 percent

Rubble land: 15 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Ildefonso soils**

*Landscape:* Lava plateaus (fig. 25)

*Landform:* Escarpments (fig. 27)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from basalt over residuum weathered from fanglomerate

*Slope:* 30 to 70 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 50 percent subangular gravel; about 20 percent subangular cobbles; about 5 percent subangular stones; about 3 percent subangular boulders

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 20 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

Ak—0 to 5 inches; extremely gravelly sandy loam

Bk1—5 to 15 inches; very gravelly sandy loam

Bk2—15 to 24 inches; very cobbly sandy loam

Bk3—24 to 56 inches; very cobbly sandy loam

2Bk4—56 to 67 inches; gravelly coarse sand

2Bk5—67 to 84 inches; very gravelly coarse sand

**Rock outcrop**

*Description:* Rock outcrop consists of exposed basalt bedrock. It occurs as steeply sloping exposures and vertical cliffs and ledges generally located above the Ildefonso soil and above Rubble land.

*Landscape:* Lava plateaus (fig. 25)

*Landform:* Escarpments, canyons (fig. 27)

*Parent material:* Basalt

*Slope:* 100 to 300 percent

*Depth to restrictive feature:* 0 inches to bedrock, lithic

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

**Rubble land**

*Description:* Rubble land consists of talus of irregularly shaped cobbles, stones, and boulders that are devoid of vegetation. It is on very steeply sloping backslopes below basalt cliffs and is the result of parts of the cliff breaking off and tumbling down slope.

*Landscape:* Lava plateaus (fig. 25)

*Landform:* Escarpments, canyons (fig. 27)

*Parent material:* Basalt

*Slope:* 70 to 90 percent

*Runoff class:* High

*Land capability subclass (nonirrigated):* 8

***Minor Components Composition***

Zacaton and similar soils: About 6 percent

Abrojo and similar soils: About 4 percent

## **140—Truehill very cobbly loam, 25 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,900 to 7,000 feet (1,798 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Truehill and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Truehill soils**

*Landscape:* Lava fields

*Landform:* Undulating hills on plateaus

*Position on landform:* Backslopes, shoulders

*Parent material:* Slope alluvium and colluvium derived from andesite

*Slope:* 25 to 45 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 2 percent subangular stones; about 30 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.4 inches (low)

*Shrink-swell potential:* About 3.1 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 32 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6e

### ***Typical Profile***

A—0 to 3 inches; very cobbly loam

Bt1—3 to 7 inches; very cobbly clay loam

Bt2—7 to 12 inches; very cobbly clay loam

Btk—12 to 18 inches; very cobbly loam

Bk1—18 to 31 inches; very cobbly loam

2Bk2—31 to 42 inches; extremely gravelly coarse sandy loam

2BCK1—42 to 56 inches; extremely gravelly coarse sandy loam

2BCK2—56 to 80 inches; extremely gravelly coarse sandy loam

***Minor Components Composition***

Rock outcrop: About 5 percent

Penistaja and similar soils: About 3 percent

Ildefonso and similar soils: About 2 percent

## **141—Truehill-Penistaja family-Rock outcrop complex, 4 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,300 feet (1,646 to 1,920 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Truehill and similar soils: 60 percent

Penistaja family and similar soils: 20 percent

Rock outcrop: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Truehill soils**

*Landscape:* Breaks

*Landform:* Toreva blocks on escarpments (fig. 27)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from basalt

*Slope:* 15 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 7 percent subangular boulders; about 4 percent subangular stones; about 30 percent subangular cobbles; about 25 percent subangular medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.6 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 20 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6e

### ***Typical Profile***

A—0 to 2 inches; extremely cobbly loam

Bt—2 to 9 inches; very cobbly loam

Bk1—9 to 17 inches; very cobbly loam

Bk2—17 to 27 inches; very cobbly loam

Bk3—27 to 45 inches; very cobbly loam

Bk4—45 to 68 inches; extremely cobbly loam

Bk5—68 to 82 inches; very cobbly loam

### **Penistaja family soils**

*Landscape:* Breaks

*Landform:* Escarpments (fig. 27)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and basalt

*Slope:* 4 to 10 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.4 inches (moderate)

*Shrink-swell potential:* About 3.7 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

#### **Typical Profile**

A—0 to 3 inches; sandy loam

Bt—3 to 12 inches; sandy clay loam

Btk1—12 to 28 inches; fine sandy loam

Btk2—28 to 45 inches; loam

Bk—45 to 80 inches; sandy loam

BC—80 to 90 inches; loam

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed basalt bedrock. It occurs as steeply sloping bedrock and knobs on cliffs and Toreva Blocks and is intermingled with the Truehill soils.

*Landscape:* Breaks (fig. 27)

*Landform:* Toreva blocks on escarpments

*Parent material:* Basalt

*Slope:* 20 to 120 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* 0 inches to bedrock, lithic

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### **Minor Components Composition**

Sandoval and similar soils: About 6 percent

Parida and similar soils: About 4 percent

## **142—Parida gravelly loam, 3 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 6,800 feet (1,859 to 2,073 meters)

*Mean annual precipitation:* 10 to 12 inches (254 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Parida and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Parida soils**

*Landscape:* Lava fields

*Landform:* Undulating plateaus (fig. 9)

*Position on landform:* Foothills

*Parent material:* Slope alluvium derived from basalt and pyroclastics

*Slope:* 3 to 10 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 20 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.2 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass,  
oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 2 inches; gravelly loam

A2—2 to 6 inches; gravelly loam

Bw1—6 to 13 inches; very gravelly coarse sandy loam

Bw2—13 to 18 inches; gravelly coarse sandy loam

Bk—18 to 34 inches; gravelly coarse sandy loam

C—34 to 82 inches; extremely gravelly loamy coarse sand

### ***Minor Components Composition***

Churipa and similar soils: About 7 percent

Penistaja and similar soils: About 3 percent

## **143—Scogg very fine sandy loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,300 to 5,600 feet (1,615 to 1,707 meters)

*Mean annual precipitation:* 9 to 12 inches (229 to 305 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Scogg and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Scogg soils**

*Landscape:* Valleys

*Landform:* Flood plains on valley floors (fig. 15 and fig. 27)

*Parent material:* Alluvium derived from granite and quartzite

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Poorly drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.9 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Seasonal high water table depth:* About 12 to 20 inches

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Populus fremontii/Salix exigua-Salix/Carex

*Potential native vegetation:* willow, sedge, cottonwood, rush

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; very fine sandy loam

C—3 to 15 inches; stratified fine sand to fine sandy loam

Cg1—15 to 24 inches; stratified loamy fine sand to very fine sandy loam

Cg2—24 to 31 inches; stratified very fine sandy loam to silt loam

2Cg3—31 to 80 inches; very gravelly coarse sand

### ***Minor Components Composition***

Chupe and similar soils: About 7 percent

Bosquecito and similar soils: About 5 percent

Mirada and similar soils: About 3 percent



## **144—Los Alamos fine sandy loam, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,900 feet (1,768 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Los Alamos and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Los Alamos soils**

*Landscape:* Lava plateaus (fig. 28)

*Landform:* Mesas

*Position on landform:* Summits

*Parent material:* Eolian material derived from volcanic ash over residuum weathered from pumice

*Slope:* 1 to 5 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 4 to 10 inches to abrupt textural change; 20 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 5.9 inches (low)

*Shrink-swell potential:* About 1.7 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* galleta, black grama, blue grama, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 3 inches; fine sandy loam (fig. 29)

A2—3 to 7 inches; fine sandy loam

Bt—7 to 17 inches; clay loam

Btk—17 to 25 inches; loam

Bk—25 to 32 inches; ashy paragravelly sandy loam

2BCK—32 to 39 inches; paragravel

2C—39 to 80 inches; paragravel

### ***Minor Components Composition***

Armenta and similar soils: About 5 percent

Navajita and similar soils: About 4 percent

Adornado and similar soils: About 1 percent



**Figure 28.—An area of Los Alamos fine sandy loam, 1 to 5 percent slopes is in the foreground. An area of Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes is in the background.**



**Figure 29.—Typical profile of Los Alamos fine sandy loam, 1 to 5 percent slopes. This profile shows a well developed argillic horizon (rich in clay) and abundant pumice in the lower part.**

## **145—Romberg very gravelly sandy loam, 25 to 55 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,800 feet (1,707 to 2,073 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Romberg and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Romberg soils**

*Landscape:* Lava plateaus

*Landform:* Hills

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from conglomerate

*Slope:* 25 to 55 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 20 percent rounded cobbles; about 45 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.7 inches (low)

*Shrink-swell potential:* About 3.3 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, oneseed juniper, blue grama, prickly pear, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; very gravelly sandy loam

Bt1—4 to 11 inches; gravelly sandy clay loam

Bt2—11 to 18 inches; very gravelly sandy clay loam

Btk—18 to 33 inches; gravelly sandy clay loam

C—33 to 79 inches; extremely cobbly loamy coarse sand

### ***Minor Components Composition***

Espiritu and similar soils: About 7 percent

Chiminet and similar soils: About 2 percent

Rock outcrop: About 1 percent

## **200—Predawn loam, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,300 feet (1,859 to 2,225 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Predawn and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Predawn soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, schist, loess, and volcanic ash

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 7.2 inches (moderate)

*Shrink-swell potential:* About 2.6 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 33 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 5 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, black grama, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; loam

BA—2 to 4 inches; loam

Bt—4 to 9 inches; clay loam

Btk1—9 to 14 inches; clay loam

Btk2—14 to 19 inches; clay loam

Bk1—19 to 27 inches; loam

Bk2—27 to 36 inches; loam

BCK1—36 to 52 inches; gravelly sandy loam

BCK2—52 to 77 inches; very gravelly coarse sand

C—77 to 86 inches; gravelly loamy sand

### Minor Components Composition

Alire and similar soils: About 6 percent

Encantado and similar soils: About 3 percent

Urban land: About 1 percent

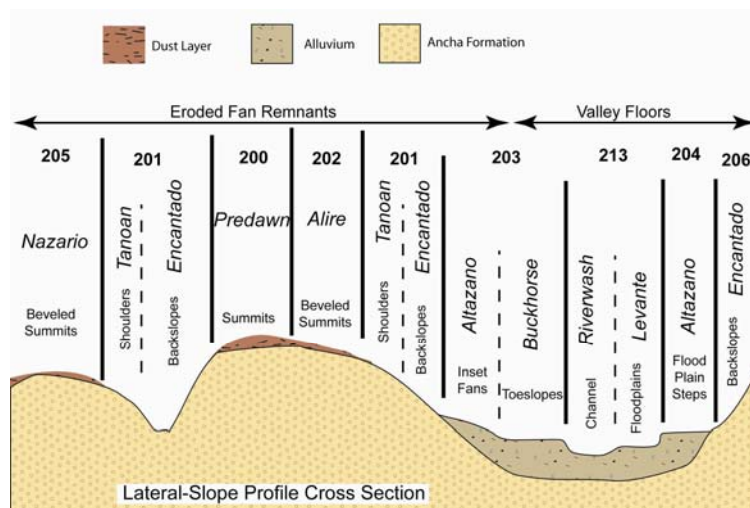


Figure 30.—Cross-section diagram of landform and landform position for map units north and west of Santa Fe at higher elevations

## **201—Tanoan-Encantado complex, 5 to 25 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,500 feet (1,676 to 2,286 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Tanoan and similar soils: 45 percent

Encantado and similar soils: 40 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Tanoan soils**

*Landscape:* Fan piedmonts (fig. 31)

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Shoulders

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from basaltic tuff or granitic sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 15 percent subrounded gravel; about 0 percent subrounded cobbles

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, galleta, black grama, ring muhly

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; gravelly sandy loam

Bk1—3 to 7 inches; loam

Bk2—7 to 24 inches; loam

Bk3—24 to 32 inches; sandy loam

Bkq—32 to 57 inches; loam

BCK1—57 to 70 inches; gravelly loamy coarse sand

BCK2—70 to 84 inches; gravelly coarse sandy loam

### **Encantado soils**

*Landscape:* Fan piedmonts (fig. 32)

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Backslopes

*Parent material:* Colluvium and slope alluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 10 to 25 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 15 percent subrounded cobbles; about 40 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 27 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 4s

#### **Typical Profile**

ABk—0 to 3 inches; very gravelly sandy loam

Bk1—3 to 9 inches; very gravelly loam

Bk2—9 to 22 inches; very gravelly coarse sandy loam

BCK1—22 to 33 inches; gravelly loamy coarse sand

BCK2—33 to 45 inches; very gravelly loamy coarse sand

BCK3—45 to 54 inches; very gravelly loamy coarse sand

C1—54 to 63 inches; gravelly loamy sand

C2—63 to 85 inches; very gravelly loamy sand

#### **Minor Components Composition**

Nazario and similar soils: About 4 percent

Buckhorse and similar soils: About 3 percent

Altazano and similar soils: About 3 percent

Urban land: About 2 percent

Encantado and similar soils: About 2 percent

Riverwash: About 1 percent



**Figure 31.—An area of Tanoan-Encantado complex, 5 to 25 percent slopes. Sparse vegetation is on the Tanoan soils.**



**Figure 32.—An area of Tanoan-Encantado complex, 5 to 25 percent slopes. The Encantado soils have some vegetation.**



## **202—Alire loam, 2 to 6 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,400 feet (1,859 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Alire and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Alire soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 30 and fig. 36)

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived granite, gneiss, schist, loess, and volcanic ash

*Slope:* 2 to 6 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.6 inches (high)

*Shrink-swell potential:* About 2.8 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 30 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 5 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt—2 to 8 inches; clay loam

Btk1—8 to 15 inches; clay loam

Btk2—15 to 28 inches; clay loam

Bk1—28 to 45 inches; loam

Bk2—45 to 57 inches; gravelly loam

BCK—57 to 71 inches; gravelly sandy loam

BCKq—71 to 105 inches; gravelly sandy loam

***Minor Components Composition***

Encantado and similar soils: About 5 percent  
Predawn and similar soils: About 2 percent  
Tanoan and similar soils: About 2 percent  
Urban land: About 1 percent

## **203—Buckhorse-Altazano complex, 2 to 8 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,500 feet (1,737 to 2,286 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Buckhorse and similar soils: 55 percent

Altazano and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Buckhorse soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.2 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, sand dropseed, galleta, ring muhly, black grama

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 4 inches; coarse sandy loam

Bt—4 to 11 inches; coarse sandy loam

Btk1—11 to 22 inches; loam

Btk2—22 to 37 inches; loam

Bk—37 to 49 inches; fine sandy loam

BCK—49 to 61 inches; sandy loam

C—61 to 83 inches; gravelly coarse sand

**Altazano soils**

*Landscape:* Fan piedmonts

*Landform:* Inset fans on eroded fan remnants (fig. 30)

*Parent material:* Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, sand dropseed, black grama, galleta

*Land capability subclass (nonirrigated):* 4w

***Typical Profile***

AC—0 to 2 inches; gravelly sandy loam

C1—2 to 8 inches; gravelly coarse sandy loam

C2—8 to 19 inches; very gravelly loamy coarse sand

C3—19 to 29 inches; gravelly sandy loam

Btkb1—29 to 46 inches; loam

Btkb2—46 to 65 inches; loam

BCKb—65 to 74 inches; gravelly coarse sandy loam

Ckb—74 to 90 inches; gravelly loamy coarse sand

***Minor Components Composition***

Junebee and similar soils: About 4 percent

Tanoan and similar soils: About 3 percent

Riverwash: About 2 percent

Urban land: About 1 percent

## **204—Altazano loamy sand, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,400 feet (1,859 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Altazano and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Altazano soils**

*Landscape:* Valleys

*Landform:* Flood plains on valley floors (fig. 30)

*Parent material:* Alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 22 to 30 inches to strongly contrasting textural stratification; 22 to 30 inches to abrupt textural change

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.1 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, Gambel oak, oneseed juniper, black grama, galleta

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

AC—0 to 3 inches; loamy sand

C1—3 to 8 inches; fine sandy loam

C2—8 to 12 inches; loamy sand

C3—12 to 18 inches; stratified sandy loam to loam

C4—18 to 26 inches; gravelly loamy coarse sand

Btkb1—26 to 29 inches; loam

Btkb2—29 to 36 inches; loam

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Bkb—36 to 58 inches; loam

BCkb1—58 to 76 inches; gravelly coarse sandy loam

BCkb2—76 to 92 inches; gravelly coarse sand

### ***Minor Components Composition***

Buckhorse and similar soils: About 5 percent

Levante and similar soils: About 3 percent

Tanoan and similar soils: About 3 percent

Riverwash: About 2 percent

Urban land: About 2 percent

## **205—Nazario gravelly loam, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,200 to 7,400 feet (1,890 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Nazario and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Nazario soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 20 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 20 to 28 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 28 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

ABk—0 to 2 inches; gravelly loam

Bk1—2 to 7 inches; gravelly loam

Bk2—7 to 15 inches; gravelly loam

Bk3—15 to 24 inches; gravelly loam

2BCK1—24 to 43 inches; very gravelly loamy coarse sand

2BCK2—43 to 52 inches; gravelly loamy coarse sand

2C1—52 to 67 inches; coarse sand

2C2—67 to 94 inches; gravelly coarse sand

***Minor Components Composition***

Alire and similar soils: About 3 percent

Tanoan and similar soils: About 3 percent

Encantado and similar soils: About 2 percent

Urban land: About 2 percent



## **206—Encantado very cobbly sandy loam, 25 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,600 feet (1,737 to 2,316 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Encantado and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Encantado soils**

*Landscape:* Fan piedmonts (fig. 33)

*Landform:* Eroded fan remnants (fig. 30)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 25 to 45 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 20 percent subrounded cobbles; about 25 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Calcium carbonate average in horizon of maximum accumulation:* About 23 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

ABk—0 to 2 inches; very cobbly sandy loam

Bk1—2 to 8 inches; gravelly sandy loam

Bk2—8 to 12 inches; gravelly coarse sandy loam

Bk3—12 to 24 inches; very gravelly coarse sandy loam

BCK—24 to 31 inches; gravelly loamy sand

BCK1—31 to 56 inches; very gravelly loamy coarse sand

BCK2—56 to 67 inches; gravelly loamy sand

C—67 to 82 inches; gravelly loamy coarse sand

***Minor Components Composition***

Nazario and similar soils: About 4 percent

Encantado and similar soils: About 3 percent

Urban land: About 2 percent

Rock outcrop: About 1 percent



**Figure 33.—An area of Encantado very cobbly sandy loam, 25 to 45 percent slopes. The steeper slopes of the Encantado soils make desirable homesites.**

## **207—Urban land**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,400 feet (1,676 to 2,256 meters)

*Mean annual precipitation:* 9 to 15 inches (229 to 381 millimeters)

*Mean annual air temperature:* 47 to 52 degrees F (8.1 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Urban land: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, sidewalks, and railroad grades. Urban land is in intensely built-up portions of the City of Santa Fe and is mostly within commercial and industrial districts. It is intermingled in places with small remnant areas of natural soil or bodies of man-made soil that have usually been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes are dominantly 1 to 5 percent, but range to 25 percent.

*Landscape:* Fan piedmonts

*Landform:* Stream terraces, eroded fan remnants

*Slope:* 1 to 5 percent

*Shape (down/across):* Linear/linear

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Alire and similar soils: About 4 percent

Panky and similar soils: About 3 percent

Buckhorse and similar soils: About 2 percent

Predawn and similar soils: About 2 percent

Altazano and similar soils: About 2 percent

Tanoan and similar soils: About 1 percent

Delvalle and similar soils: About 1 percent

## **208—Alire-Urban land complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,400 to 7,400 feet (1,951 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Alire and similar soils: 50 percent

Urban land: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Alire soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.2 inches (high)

*Shrink-swell potential:* About 2.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 29 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 5 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 4 inches; loam

Bt—4 to 11 inches; clay loam

Btk1—11 to 20 inches; clay loam

Btk2—20 to 27 inches; loam

Bk1—27 to 42 inches; loam

Bk2—42 to 51 inches; gravelly loam

Bkq1—51 to 69 inches; gravelly loam

Bkq2—69 to 95 inches; gravelly loam

C—95 to 99 inches; gravelly sandy loam

**Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Alire soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Slope:* 0 to 5 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8s

***Minor Components Composition***

Predawn and similar soils: About 4 percent

Tanoan and similar soils: About 3 percent

Altazano and similar soils: About 2 percent

Encantado and similar soils: About 1 percent

## **209—Dondiego-Urban land complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,300 to 7,800 feet (1,920 to 2,377 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Dondiego and similar soils: 55 percent

Urban land: 40 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Dondiego soils**

*Landscape:* Valleys

*Landform:* High stream terraces (fig. 34)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 69 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.8 inches (moderate)

*Shrink-swell potential:* About 4.1 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; sandy loam

Bt1—2 to 7 inches; loam

Bt2—7 to 14 inches; loam

Bt3—14 to 26 inches; loam

Btk—26 to 37 inches; loam

Btk2—37 to 51 inches; loam

Bk—51 to 66 inches; gravelly loam

BCK—66 to 92 inches; gravelly loamy coarse sand

C—92 to 106 inches; very gravelly coarse sand

### **Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Dondiego soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.

*Landscape:* Valleys

*Landform:* High stream terraces (fig. 34)

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Meseeya and similar soils: About 3 percent

Altazano and similar soils: About 2 percent

## **210—Urban land-Buckhorse-Altazano complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,500 feet (1,737 to 2,286 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Urban land: 60 percent

Buckhorse and similar soils: 20 percent

Altazano and similar soils: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Urban land**

*Description:* Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with the Buckhorse and Altazano soils that are either slightly disturbed or have been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8s

#### **Buckhorse soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.2 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy



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*Potential native vegetation:* blue grama, sand dropseed, galleta, ring muhly, black grama

*Land capability subclass (nonirrigated):* 4c

### **Typical Profile**

A—0 to 4 inches; coarse sandy loam  
Bt—4 to 11 inches; coarse sandy loam  
Btk1—11 to 22 inches; loam  
Btk2—22 to 37 inches; loam  
Bk—37 to 49 inches; fine sandy loam  
BCk—49 to 61 inches; sandy loam  
C—61 to 83 inches; gravelly coarse sand

### **Altazano soils**

*Landscape:* Fan piedmonts

*Landform:* Inset fans on eroded fan remnants

*Parent material:* Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, sand dropseed, black grama, galleta

*Land capability subclass (nonirrigated):* 4w

### **Typical Profile**

AC—0 to 2 inches; gravelly sandy loam  
C1—2 to 8 inches; gravelly coarse sandy loam  
C2—8 to 19 inches; very gravelly loamy coarse sand  
C3—19 to 29 inches; gravelly sandy loam  
Btkb1—29 to 46 inches; loam  
Btkb2—46 to 65 inches; loam  
BCkb—65 to 74 inches; gravelly coarse sandy loam  
Ckb—74 to 90 inches; gravelly loamy coarse sand

### **Minor Components Composition**

Levante and similar soils: About 7 percent

Riverwash: About 3 percent

## **211—Tanoan-Encantado-Urban land complex, 5 to 25 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,500 feet (1,676 to 2,286 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Tanoan and similar soils: 35 percent

Encantado and similar soils: 30 percent

Urban land: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Tanoan soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Shoulders

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from basaltic tuff or granitic sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 15 percent subrounded gravel; about 0 percent subrounded cobbles

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, galleta, black grama, ring muhly

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; gravelly sandy loam

Bk1—3 to 7 inches; loam

Bk2—7 to 24 inches; loam

Bk3—24 to 32 inches; sandy loam

Bkq—32 to 57 inches; loam

BCK1—57 to 70 inches; gravelly loamy coarse sand

BCK2—70 to 84 inches; gravelly coarse sandy loam

### **Encantado soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Backslopes

*Parent material:* Colluvium and slope alluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 10 to 25 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 15 percent subrounded cobbles; about 40 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 27 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 4s

### **Typical Profile**

ABk—0 to 3 inches; very gravelly sandy loam

Bk1—3 to 9 inches; very gravelly loam

Bk2—9 to 22 inches; very gravelly coarse sandy loam

Bck1—22 to 33 inches; gravelly loamy coarse sand

Bck2—33 to 45 inches; very gravelly loamy coarse sand

Bck3—45 to 54 inches; very gravelly loamy coarse sand

C1—54 to 63 inches; gravelly loamy sand

C2—63 to 85 inches; very gravelly loamy sand

### **Urban land**

*Description:* Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, tennis courts, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with Tanoan and Encantado soils that are either undisturbed or have been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 25 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Slope:* 1 to 25 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8

***Minor Components Composition***

Altazano and similar soils: About 4 percent  
Junebee and similar soils: About 3 percent  
Nazario and similar soils: About 2 percent  
Alire and similar soils: About 1 percent

## **212—Junebee gravelly sandy loam, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,800 feet (1,859 to 2,377 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Junebee and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Junebee soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 34)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granitic sandstone, fanglomerate, and mudstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 15 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.8 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 7 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Deep Sand

*Potential native vegetation:* Indian ricegrass, blue grama, sand dropseed, galleta

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; gravelly sandy loam

Btk1—3 to 14 inches; sandy loam

Btk2—14 to 29 inches; sandy loam

Btk3—29 to 38 inches; sandy loam

Btk4—38 to 48 inches; gravelly coarse sandy loam

Btk5—48 to 58 inches; gravelly coarse sandy loam

Bk1—58 to 72 inches; gravelly coarse sandy loam

Bk2—72 to 88 inches; gravelly coarse sandy loam

BCk—88 to 112 inches; gravelly loamy coarse sand

C—112 to 122 inches; gravelly loamy coarse sand

***Minor Components Composition***

Altazano and similar soils: About 6 percent

Levante and similar soils: About 5 percent

Riverwash: About 4 percent

## **213—Levante-Riverwash complex, 1 to 3 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,700 feet (1,707 to 2,347 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Levante and similar soils: 55 percent

Riverwash: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Levante soils**

*Landscape:* Valleys

*Landform:* Narrow flood plains on valley floors (fig. 30 and fig. 34)

*Parent material:* Alluvium derived from granite, gneiss, schist, and granitic sandstone

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 7 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's  
rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

AC—0 to 4 inches; loamy sand

C1—4 to 17 inches; coarse sand

C2—17 to 32 inches; gravelly coarse sand

C3—32 to 45 inches; stratified gravelly loamy coarse sand to gravelly coarse  
sand

C4—45 to 58 inches; gravelly loamy coarse sand

C5—58 to 86 inches; very gravelly coarse sand

C6—86 to 122 inches; very gravelly coarse sand

### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Levante soil.

*Landscape:* Valleys

*Landform:* Channels on flood plains (fig. 30 and fig. 34)

*Parent material:* Alluvium derived from mixed

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded (shape or size unspecified); about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### **Minor Components Composition**

Altazano and similar soils: About 5 percent

Dondiego and similar soils: About 3 percent

Urban land: About 2 percent



## **214—Nazario-Urban land complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,200 to 7,400 feet (1,890 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Nazario and similar soils: 55 percent

Urban land: 30 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Nazario soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 20 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 20 to 28 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 28 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

ABk—0 to 2 inches; gravelly loam

Bk1—2 to 7 inches; gravelly loam

Bk2—7 to 15 inches; gravelly loam

Bk3—15 to 24 inches; gravelly loam

2Bck1—24 to 43 inches; very gravelly loamy coarse sand

2Bck2—43 to 52 inches; gravelly loamy coarse sand

2C1—52 to 67 inches; coarse sand

2C2—67 to 94 inches; gravelly coarse sand

### **Urban land**

*Description:* Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, tennis courts, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with the Nazario soil that are either undisturbed or have been landscaped and planted.

Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Slope:* 1 to 8 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Alire and similar soils: About 8 percent

Encantado and similar soils: About 4 percent

Tanoan and similar soils: About 3 percent

## **215—Predawn-Urban land complex, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,400 to 7,300 feet (1,951 to 2,225 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Predawn and similar soils: 60 percent

Urban land: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Predawn soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Position on landform:* Summits

*Parent material:* Alluvium derived from granite, gneiss, schist, loess, and volcanic ash

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 4 to 6 inches to strongly contrasting textural stratification;  
4 to 6 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 7.6 inches (moderate)

*Shrink-swell potential:* About 2.7 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 48 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 5 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, black grama, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

AE—0 to 5 inches; loam

Bt—5 to 10 inches; clay

Btk1—10 to 16 inches; clay loam

Btk2—16 to 23 inches; clay loam

Bk1—23 to 28 inches; loam

Bk2—28 to 34 inches; loam

## Soil Survey of Santa Fe County Area, New Mexico

Bky1—34 to 48 inches; loam  
Bky2—48 to 73 inches; loam  
BCk1—73 to 88 inches; loam  
BCk2—88 to 100 inches; sandy loam

### **Urban land**

*Description:* Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Predawn soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Land capability subclass (nonirrigated):* 8s

### ***Minor Components Composition***

Alire and similar soils: About 7 percent

Tanoan and similar soils: About 3 percent

## **216—Dondiego loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,400 feet (1,859 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Dondiego and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Dondiego soils**

*Landscape:* Valleys

*Landform:* Low stream terraces on valley floors (fig. 34)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.1 inches (moderate)

*Shrink-swell potential:* About 4.1 percent (moderate)

*Flooding hazard:* Very rare

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt1—2 to 9 inches; loam

Bt2—9 to 22 inches; loam

Btk—22 to 28 inches; loam

BCk—28 to 36 inches; sandy loam

Btb1—36 to 48 inches; loam

Btb2—48 to 59 inches; loam

BCb—59 to 69 inches; gravelly sandy loam

Cb1—69 to 85 inches; gravelly loamy coarse sand

Cb2—85 to 102 inches; stratified gravelly loamy coarse sand to sandy loam

### ***Minor Components Composition***

Ohke and similar soils: About 7 percent

Altazano and similar soils: About 4 percent

Urban land: About 4 percent

## **217—Ohke sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,700 feet (1,859 to 2,347 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Ohke and similar soils: 80 percent

Minor components: 20 percent

### ***Component Descriptions***

#### **Ohke soils**

*Landscape:* Valleys

*Landform:* Low stream terraces on valley floors (fig. 34)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Very rare

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, Gambel oak, oneseed juniper, black grama, galleta

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A1—0 to 3 inches; sandy loam

A2—3 to 10 inches; gravelly coarse sandy loam

AC—10 to 14 inches; gravelly loamy coarse sand

C1—14 to 22 inches; gravelly coarse sand

C2—22 to 29 inches; very gravelly coarse sand

C3—29 to 49 inches; gravelly coarse sand

C4—49 to 85 inches; stratified very gravelly coarse sand to gravelly coarse sand

C5—85 to 98 inches; sandy loam

C6—98 to 106 inches; gravelly loamy sand

### ***Minor Components Composition***

Dondiego and similar soils: About 8 percent

Altazano and similar soils: About 7 percent

Urban land: About 5 percent

## **218—Pedregal very gravelly loam, 2 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,900 to 7,600 feet (1,798 to 2,316 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Pedregal and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Pedregal soils**

*Landscape:* Fan piedmonts

*Landform:* Narrow, eroded fan remnants (fig. 34)

*Position on landform:* Shoulders, beveled summits

*Parent material:* Alluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone, siltstone, and fanglomerate

*Slope:* 2 to 15 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent rounded cobbles; about 40 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 3.6 inches (low)

*Shrink-swell potential:* About 1.7 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 39 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-

Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, twoneedle pinyon, ring muhly

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A—0 to 2 inches; very gravelly loam

Bt1—2 to 5 inches; very gravelly clay loam

Bt2—5 to 8 inches; very gravelly clay loam

Btk—8 to 12 inches; very gravelly sandy clay loam

Bk1—12 to 22 inches; very gravelly sandy loam

Bk2—22 to 45 inches; extremely gravelly coarse sandy loam

BCK—45 to 62 inches; extremely gravelly coarse sand

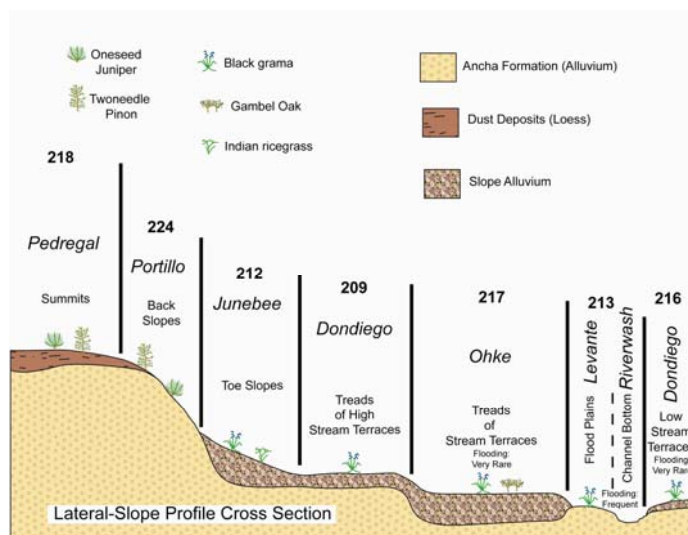
C1—62 to 81 inches; gravelly loamy sand

2C2—81 to 92 inches; silt loam

2C3—92 to 104 inches; silt loam

### ***Minor Components Composition***

Predawn and similar soils: About 4 percent  
 Alire and similar soils: About 2 percent  
 Urban land: About 2 percent  
 Encantado and similar soils: About 1 percent  
 Nazario and similar soils: About 1 percent



**Figure 34.—Cross-section diagram of landform and landform position for map units mostly south and west of Santa Fe at higher elevations.**



## **219—Ohke sandy loam, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,300 to 6,700 feet (1,920 to 2,042 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Ohke and similar soils: 80 percent

Minor components: 20 percent

### ***Component Descriptions***

#### **Ohke soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 34)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from basaltic tuff

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Hills

*Potential native vegetation:* blue grama, Gambel oak, oneseed juniper, black grama,  
galleta

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A—0 to 3 inches; sandy loam

Bw—3 to 9 inches; gravelly sandy loam

Bkq—9 to 13 inches; gravelly sandy loam

BCkq1—13 to 27 inches; gravelly loamy sand

BCkq2—27 to 48 inches; loamy sand

Cq—48 to 82 inches; loamy sand

C—82 to 98 inches; loamy sand

### ***Minor Components Composition***

Nazario and similar soils: About 7 percent

Tanoan and similar soils: About 6 percent

Rock outcrop: About 4 percent

Urban land: About 3 percent

## **220—Horcado-Nazario complex, 2 to 35 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,100 feet (1,707 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Horcado and similar soils: 60 percent

Nazario and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Horcado soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 35)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 15 to 35 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 50 percent rounded gravel; about 3 percent rounded cobbles

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* Gambel oak, blue grama, oneseed juniper, bottlebrush squirreltail, sideoats grama, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

A—0 to 4 inches; very gravelly coarse sandy loam

Bk1—4 to 8 inches; gravelly coarse sandy loam

Bk2—8 to 17 inches; very gravelly loamy coarse sand

Bck1—17 to 33 inches; very gravelly loamy coarse sand

Bck2—33 to 45 inches; very gravelly loamy sand

Bck3—45 to 74 inches; very gravelly loamy coarse sand

Bck4—74 to 88 inches; very gravelly coarse sand

Bckq1—88 to 94 inches; gravelly sandy loam

Bckq2—94 to 105 inches; gravelly sandy loam

### **Nazario soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 35)

*Position on landform:* Beveled summits, shoulders

*Parent material:* Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 2 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 3 percent rounded cobbles; about 35 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 17 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* blue grama, black grama, New Mexico feathergrass, oneseed juniper, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 4s

### **Typical Profile**

ABk—0 to 2 inches; very gravelly loam

Bk1—2 to 5 inches; gravelly loam

Bk2—5 to 16 inches; gravelly loam

Bk3—16 to 31 inches; gravelly coarse sandy loam

2BCK1—31 to 49 inches; very gravelly coarse sand

2BCK2—49 to 63 inches; gravelly coarse sand

2BCK3—63 to 76 inches; gravelly loamy coarse sand

2C1—76 to 96 inches; gravelly coarse sand

2C2—96 to 120 inches; very gravelly loamy coarse sand

### **Minor Components Composition**

Encantado and similar soils: About 4 percent

Latierra and similar soils: About 3 percent

Lamesilla and similar soils: About 2 percent

Urban land: About 1 percent

## **221—Latierra-Lamesilla-Levante complex, 2 to 15 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,300 feet (1,676 to 2,225 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Latierra and similar soils: 45 percent

Lamesilla and similar soils: 30 percent

Levante and similar soils: 15 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Latierra soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 35)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 20 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 31 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.1 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; gravelly coarse sandy loam

Bt1—3 to 7 inches; gravelly coarse sandy loam

Bt2—7 to 12 inches; gravelly coarse sandy loam

Btk1—12 to 20 inches; gravelly coarse sandy loam

Btk2—20 to 26 inches; gravelly sandy clay loam

Bk—26 to 37 inches; gravelly coarse sandy loam

BCK—37 to 46 inches; very gravelly loamy coarse sand

C1—46 to 60 inches; loam

C2—60 to 83 inches; very gravelly loamy coarse sand

C3—83 to 110 inches; gravelly coarse sandy loam

### **Lamesilla soils**

*Landscape:* Fan piedmonts

*Landform:* Inset fans on eroded fan remnants (fig. 35)

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 40 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.4 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, Gambel oak, oneseed juniper, black grama,  
galleta

*Land capability subclass (nonirrigated):* 4w

### **Typical Profile**

AC1—0 to 2 inches; very gravelly coarse sandy loam

AC2—2 to 6 inches; gravelly coarse sandy loam

Bw1—6 to 20 inches; gravelly coarse sandy loam

Bw2—20 to 34 inches; gravelly coarse sandy loam

Bw3—34 to 52 inches; very gravelly coarse sandy loam

Bk—52 to 65 inches; gravelly sandy clay loam

C1—65 to 83 inches; gravelly coarse sandy loam

C2—83 to 104 inches; stratified very gravelly coarse sand to gravelly sandy loam

C3—104 to 121 inches; very gravelly coarse sand

### **Levante soils**

*Landscape:* Fan piedmonts

*Landform:* Narrow flood plains on eroded fan remnants (fig. 35)

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 2 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 30 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

## Soil Survey of Santa Fe County Area, New Mexico

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 4w

### **Typical Profile**

AC—0 to 4 inches; gravelly coarse sand

C1—4 to 13 inches; stratified gravelly coarse sand to sandy loam

C2—13 to 29 inches; stratified gravelly coarse sand to coarse sandy loam

C3—29 to 42 inches; stratified gravelly coarse sand to gravelly loamy coarse sand

C4—42 to 55 inches; very gravelly coarse sand

Btb—55 to 65 inches; coarse sandy loam

BCkb1—65 to 81 inches; stratified gravelly loamy coarse sand to gravelly sandy loam

BCkb2—81 to 96 inches; gravelly loamy coarse sand

BCkb3—96 to 105 inches; very gravelly loamy coarse sand

### **Minor Components Composition**

Horcado and similar soils: About 4 percent

Altazano and similar soils: About 3 percent

Dondiego and similar soils: About 3 percent

## **222—Sipapu-Yuzarra-Kachina complex, 5 to 65 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,800 feet (1,707 to 2,377 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Sipapu and similar soils: 45 percent

Yuzarra and similar soils: 30 percent

Kachina and similar soils: 15 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Sipapu soils**

*Landscape:* Piedmont slopes

*Landform:* Ridges, hills (fig. 35)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite and gneiss over residuum weathered from granitic sandstone, siltstone, and mudstone

*Slope:* 20 to 65 percent

*Shape (down/across):* Convex/convex; linear

*Surface fragments:* About 5 percent rounded cobbles; about 25 percent rounded gravel

*Depth class:* Very shallow

*Depth to restrictive feature:* 6 to 10 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 12 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* mountain mahogany, oneseed juniper, twoneedle pinyon, black grama, sideoats grama

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 1 inch; gravelly sandy loam

Bk—1 inch to 3 inches; sandy loam

2BCK—3 to 8 inches; very paragravelly fine sandy loam

2Cr—8 to 18 inches; cemented bedrock

### **Yuzarra soils**

*Landscape:* Piedmont slopes

*Landform:* Ridges, hills (fig. 35)

*Position on landform:* Beveled summits

*Parent material:* Alluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone and fanglomerate

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/linear, convex

*Surface fragments:* About 5 percent rounded cobbles; about 45 percent rounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 35 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, black grama, little bluestem, sideoats grama

*Land capability subclass (nonirrigated):* 4s

#### **Typical Profile**

ABk—0 to 3 inches; very gravelly sandy loam

Bk1—3 to 10 inches; gravelly sandy loam

2Bk2—10 to 22 inches; very gravelly coarse sand

2Bk3—22 to 26 inches; gravelly sand

2Bk4—26 to 34 inches; very gravelly coarse sand

2Cr—34 to 44 inches; cemented bedrock

### **Kachina soils**

*Landscape:* Piedmont slopes

*Landform:* Ridges, hills (fig. 35)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 79 to 98 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.3 inches (high)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 7 percent



## Soil Survey of Santa Fe County Area, New Mexico

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, true mountain mahogany, sideoats grama, eriogonum, little bluestem

*Land capability subclass (nonirrigated):* 4c

### **Typical Profile**

A—0 to 3 inches; fine sandy loam

Bk1—3 to 13 inches; fine sandy loam

Bk2—13 to 24 inches; sandy clay loam

Bk3—24 to 44 inches; loam

BCK1—44 to 53 inches; sandy loam

BCK2—53 to 73 inches; gravelly sandy loam

BCK3—73 to 81 inches; gravelly sandy clay loam

2BCK4—81 to 93 inches; very paragravelly silty clay loam

2Cr—93 to 103 inches; cemented bedrock

### **Minor Components Composition**

Junebee and similar soils: About 3 percent

Badland: About 2 percent

Dondiego and similar soils: About 2 percent

Levante and similar soils: About 1 percent

Rock outcrop: About 1 percent

Urban land: About 1 percent

## **223—Kachina fine sandy loam, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,300 feet (1,707 to 2,225 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Kachina and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Kachina soils**

*Landscape:* Piedmont slopes

*Landform:* Hills (fig. 35)

*Position on landform:* Toeslopes

*Parent material:* Alluvium derived micaceous sandstone, siltstone, mudstone, and fanglomerate

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 9.7 inches (high)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 11 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, Ericameria nauseosa ssp. nauseosa var. nauseosa, sideoats grama, blue grama

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; fine sandy loam

Bk1—3 to 7 inches; loam

Bk2—7 to 19 inches; sandy clay loam

Bk3—19 to 26 inches; loam

Bck1—26 to 36 inches; loam

Bck2—36 to 48 inches; loam

Bck3—48 to 59 inches; loam

Bck4—59 to 84 inches; fine sandy loam

Bck5—84 to 102 inches; very fine sandy loam

Bck6—102 to 120 inches; gravelly sandy loam

***Minor Components Composition***

Sipapu and similar soils: About 5 percent  
Junebee and similar soils: About 4 percent  
Levante and similar soils: About 3 percent  
Urban land: About 2 percent  
Yuzarra and similar soils: About 1 percent

## **224—Portillo extremely gravelly sandy loam, 25 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,900 to 7,400 feet (1,798 to 2,256 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Portillo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Portillo soils**

*Landscape:* Fan piedmonts

*Landform:* Eroded fan remnants (fig. 34)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone, siltstone, and fanglomerate

*Slope:* 25 to 50 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 20 percent cobbles; about 50 percent rounded gravels; less than 1 percent rounded stones

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 4.2 inches (low)

*Shrink-swell potential:* About 1.7 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 33 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* Gambel oak, oneseed juniper, twoneedle pinyon, blue grama

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; extremely gravelly sandy loam

Bt1—3 to 7 inches; very gravelly clay loam

Bt2—7 to 15 inches; very gravelly sandy clay loam

Btk—15 to 17 inches; very gravelly sandy clay loam

Bk1—17 to 26 inches; very gravelly sandy loam

Bk2—26 to 34 inches; very gravelly coarse sandy loam

2Bck1—34 to 53 inches; gravelly loamy sand

2Bck2—53 to 66 inches; coarse sandy loam

2Bck3—66 to 102 inches; gravelly loamy coarse sand

2C—102 to 120 inches; gravelly loamy coarse sand

***Minor Components Composition***

Encantado and similar soils: About 6 percent

Pedregal and similar soils: About 3 percent

Sipapu and similar soils: About 1 percent

## **225—Encantado-Resolana complex, 35 to 70 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 7,900 feet (1,829 to 2,408 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 45 to 49 degrees F (7.2 to 9.4 degrees C)

*Frost-free period:* 120 to 150 days

### ***Map Unit Composition***

Encantado and similar soils: 45 percent

Resolana and similar soils: 40 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Encantado soils**

*Landscape:* Fan piedmonts

*Landform:* South-facing eroded fan remnants (fig. 35)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone

*Slope:* 35 to 60 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent rounded cobbles; about 50 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, lithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 21 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

ABk—0 to 1 inch; extremely gravelly coarse sandy loam

Btk—1 inch to 4 inches; very gravelly coarse sandy loam

Bk1—4 to 9 inches; very gravelly coarse sandy loam

Bk2—9 to 16 inches; very gravelly coarse sandy loam

Bk3—16 to 33 inches; extremely gravelly loamy coarse sand

2BCK1—33 to 41 inches; gravelly loamy coarse sand

2BCK2—41 to 51 inches; very gravelly loamy coarse sand

2BCK3—51 to 62 inches; gravelly coarse sand

2R—62 to 72 inches; cemented bedrock

### **Resolana soils**

*Landscape:* Fan piedmonts

*Landform:* North-facing eroded fan remnants (fig. 35)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived granite, gneiss, and schist over residuum weathered from granitic conglomerate

*Slope:* 40 to 70 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent rounded cobbles; about 40 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 2.6 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 19 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta

*Land capability subclass (nonirrigated):* 7e

### **Typical Profile**

A—0 to 1 inch; very gravelly coarse sandy loam

Bt—1 inch to 5 inches; gravelly sandy clay loam

Btk1—5 to 11 inches; very gravelly sandy clay loam

Btk2—11 to 17 inches; very gravelly coarse sandy loam

Btk3—17 to 24 inches; very gravelly coarse sandy loam

2Bk1—24 to 34 inches; extremely gravelly coarse sandy loam

2Bk2—34 to 43 inches; extremely gravelly coarse sandy loam

2Bk3—43 to 63 inches; gravelly coarse sandy loam

2R—63 to 73 inches; cemented bedrock

### **Minor Components Composition**

Nazario and similar soils: About 5 percent

Crucitas and similar soils: About 4 percent

Levante and similar soils: About 3 percent

Riverwash: About 2 percent

Adellern and similar soils: About 1 percent

## **226—Crucitas gravelly fine sandy loam, 2 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,500 to 7,300 feet (1,981 to 2,225 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Crucitas and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Crucitas soils**

*Landscape:* Valleys

*Landform:* Flood plain steps on valley floors (fig. 35)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 2 to 10 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 30 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 30 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.7 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, Bigelow's rubber

rabbitbrush, Apacheplume, blue grama, prickly pear

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 1 inch; gravelly fine sandy loam

Bw1—1 inch to 6 inches; gravelly sandy loam

Bw2—6 to 15 inches; gravelly sandy loam

Bw3—15 to 25 inches; gravelly sandy loam

Bw4—25 to 36 inches; gravelly sandy loam

2C—36 to 46 inches; extremely gravelly loamy coarse sand

2Bck1—46 to 60 inches; very gravelly coarse sand

2Bck2—60 to 72 inches; extremely gravelly coarse sand

2Bck3—72 to 110 inches; stratified gravelly coarse sand to gravelly fine sandy loam



### Minor Components Composition

Levante and similar soils: About 7 percent

Ohke and similar soils: About 6 percent

Urban land: About 2 percent

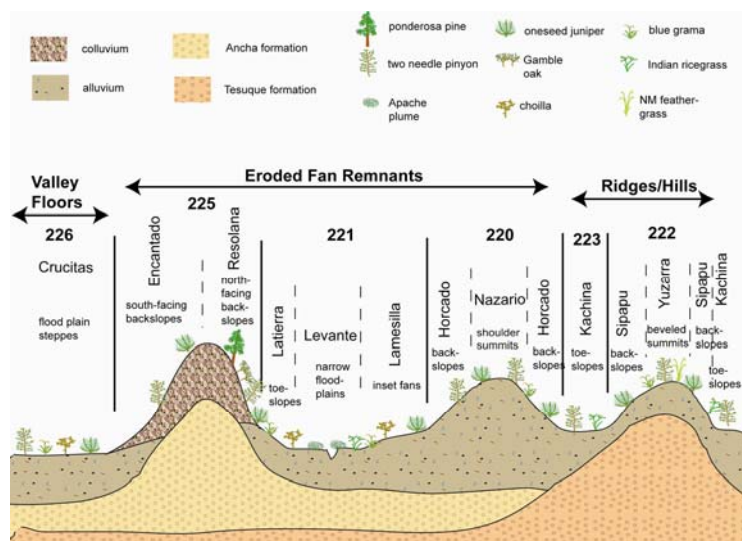


Figure 35.—Cross-section diagram of landform and landform position for map units north and east of Santa Fe at higher elevations.

### **300—Arnor gravelly sandy loam, 2 to 8 percent slopes**

#### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,800 to 8,400 feet (2,073 to 2,560 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

#### ***Map Unit Composition***

Arnor and similar soils: 90 percent

Minor components: 10 percent

#### ***Component Descriptions***

##### **Arnor soils**

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 20 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 7.4 inches (moderate)

*Shrink-swell potential:* About 4.2 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis

*Potential native vegetation:* blue grama, oneseed juniper, bottlebrush squirreltail, twoneedle pinyon

*Land capability subclass (nonirrigated):* 4c

#### ***Typical Profile***

A—0 to 4 inches; gravelly sandy loam

Bt1—4 to 9 inches; gravelly sandy clay loam

Bt2—9 to 15 inches; gravelly sandy clay loam

Bt3—15 to 24 inches; gravelly sandy clay loam

Btk—24 to 35 inches; gravelly sandy clay loam

Ab—35 to 46 inches; gravelly sandy clay loam

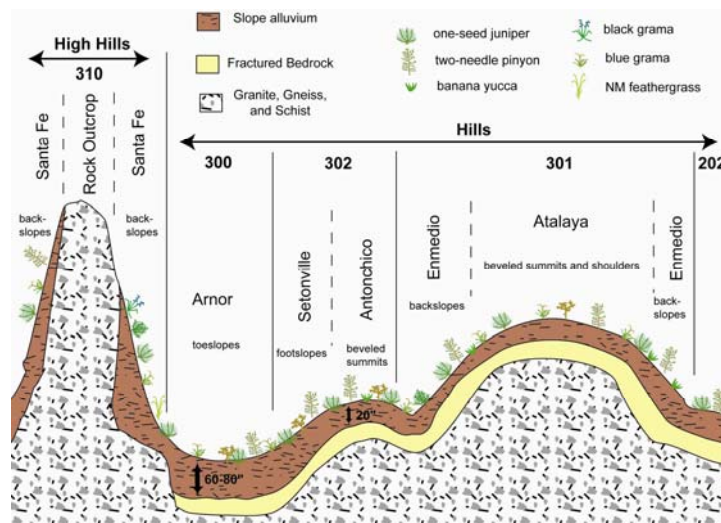
Btkb—46 to 52 inches; gravelly sandy clay loam

2B/Ctkb—52 to 66 inches; very gravelly coarse sandy loam

2Crtk—66 to 80 inches; bedrock

### ***Minor Components Composition***

Setonville and similar soils: About 4 percent  
Antonchico and similar soils: About 3 percent  
Riverwash: About 2 percent  
Urban land: About 1 percent



**Figure 36.—Cross-section diagram of landform and landform position for map units southeast of Santa Fe at higher elevations.**

## **301—Enmedio-Atalaya-Rock outcrop complex, 5 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,400 to 8,500 feet (1,951 to 2,591 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Enmedio and similar soils: 60 percent

Atalaya and similar soils: 20 percent

Rock outcrop: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Enmedio soils**

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 15 to 60 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 40 percent subrounded gravel; about 25 percent subrounded cobbles; about 1 percent subrounded stones

*Depth class:* Deep

*Depth to restrictive feature:* 16 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 2.1 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii

*Potential native vegetation:* blue grama, twoneedle pinyon, oneseed juniper, skunkbush sumac, Gambel oak

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 2 inches; extremely cobbly sandy loam

Bt1—2 to 5 inches; very gravelly sandy clay loam

Bt2—5 to 13 inches; very gravelly sandy clay loam

Bt3—13 to 19 inches; very gravelly sandy clay loam

2Ct—19 to 35 inches; cobbles

2C—35 to 46 inches; cobbles

2R—46 to 56 inches; bedrock

### **Atalaya soils**

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Position on landform:* Shoulders, beveled summits

*Parent material:* Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite and schist

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 45 percent subrounded gravel; about 10 percent subrounded cobbles; less than 1 percent subrounded stones

*Depth class:* Deep

*Depth to restrictive feature:* 20 to 40 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 1.0 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii

*Potential native vegetation:* Gambel oak, blue grama, twoneedle pinyon, oneseed juniper

*Land capability subclass (nonirrigated):* 4e

### **Typical Profile**

A—0 to 1 inch; very gravelly sandy loam

Bt1—1 inch to 4 inches; gravelly coarse sandy loam

Bt2—4 to 7 inches; gravelly coarse sandy loam

Bt3—7 to 12 inches; gravelly coarse sandy loam

BC1—12 to 24 inches; gravelly coarse sandy loam

BC2—24 to 34 inches; cobbly coarse sandy loam

2CBk—34 to 50 inches; cobbles

2R—50 to 60 inches; bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Enmedio and Atalaya soils.

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Parent material:* Granite and gneiss

*Slope:* 30 to 140 percent

*Shape (down/across):* Linear/linear

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

### **Minor Components Composition**

Setonville and similar soils: About 7 percent

Urban land: About 3 percent

## **302—Setonville-Antonchico complex, 3 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,300 to 8,200 feet (1,920 to 2,499 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Setonville and similar soils: 70 percent

Antonchico and similar soils: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Setonville soils**

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Position on landform:* Foothills

*Parent material:* Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 5 to 15 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 5 percent subrounded cobbles; about 50 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 20 to 31 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 32 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis

*Potential native vegetation:* twoneedle pinyon, bottlebrush squirreltail, blue grama, oneseed juniper, Gambel oak

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A—0 to 2 inches; very gravelly sandy loam

Bt—2 to 8 inches; very gravelly clay loam

Btk—8 to 13 inches; very gravelly sandy clay loam

Bk1—13 to 20 inches; gravelly sandy clay loam

Bk2—20 to 28 inches; very gravelly sandy loam

2BCK1—28 to 36 inches; gravel

2BCK2—36 to 45 inches; cobbles

2R—45 to 55 inches; bedrock

**Antonchico soils**

*Landscape:* Foothills

*Landform:* Hills (fig. 36)

*Position on landform:* Beveled summits

*Parent material:* Slope alluvium derived from granite, gneiss, and schist over residuum weathered from schist

*Slope:* 3 to 5 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent subrounded gravel; about 5 percent subrounded cobbles

*Depth class:* Deep

*Depth to restrictive feature:* 20 to 42 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.5 inches (low)

*Shrink-swell potential:* About 1.7 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 26 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, bottlebrush squirreltail, blue grama

*Land capability subclass (nonirrigated):* 4c

**Typical Profile**

A—0 to 2 inches; gravelly sandy loam

Bt1—2 to 7 inches; gravelly sandy clay loam

Bt2—7 to 14 inches; gravelly sandy clay loam

Bt3—14 to 20 inches; gravelly sandy clay loam

2BCK—20 to 42 inches; cobbles

2R—42 to 52 inches; bedrock

**Minor Components Composition**

Atalaya and similar soils: About 5 percent

Enmedio and similar soils: About 4 percent

Urban land: About 1 percent

### **303—Morenda, Fiesta, and Espanola soils, 1 to 85 percent slopes, flooded**

#### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,800 to 8,500 feet (2,073 to 2,591 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 110 to 130 days

#### ***Map Unit Composition***

Fiesta and similar soils: 35 percent

Morenda, inset fan and similar soils: 25 percent

Morenda, floodplain and similar soils: 20 percent

Espanola and similar soils: 15 percent

Minor components: 5 percent

#### ***Component Descriptions***

##### **Morenda, inset fan soils**

*Landscape:* Valleys

*Landform:* Inset fans on valley floors (fig. 37)

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 5 to 20 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.0 inches (moderate)

*Shrink-swell potential:* About 3.6 percent (moderate)

*Flooding hazard:* Occasional

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii

*Potential native vegetation:*

Common trees: Ponderosa pine

Other plants: Gambel oak, Arizona fescue, muttongrass, elk sedge, ponderosa pine

*Land capability subclass (nonirrigated):* 3e

#### ***Typical Profile***

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; coarse sandy loam

Bw1—4 to 16 inches; gravelly coarse sandy loam

Bw2—16 to 26 inches; gravelly coarse sandy loam

Bw3—26 to 41 inches; gravelly coarse sandy loam

Btb—41 to 53 inches; sandy clay loam

Btkb—53 to 70 inches; loam

2BCKb—70 to 83 inches; gravelly coarse sand



**Morenda, flood plain soils**

*Landscape:* Valleys

*Landform:* Low stream terraces on valley floors (fig. 37)

*Position on landform:* Tread

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Moderately well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 2.8 percent (low)

*Flooding hazard:* Occasional

*Seasonal high water table depth:* About 39 to 59 inches

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* *Populus fremontii*/Salix/Carex

*Potential native vegetation:* willow, cottonwood, sedge

*Land capability subclass (nonirrigated):* 8

**Typical Profile**

A—0 to 3 inches; sandy loam

AB—3 to 9 inches; sandy loam

Bw1—9 to 20 inches; loam

Bw2—20 to 27 inches; loam

Bw3—27 to 35 inches; sandy loam

BC—35 to 46 inches; gravelly coarse sandy loam

2Cg1—46 to 56 inches; very gravelly coarse sand

2Cg2—56 to 81 inches; extremely gravelly coarse sand

**Fiesta soils**

*Landscape:* Valleys

*Landform:* Valley sides (fig. 37)

*Position on landform:* Footslopes

*Parent material:* Slope alluvium derived from granite, gneiss, and schist

*Slope:* 10 to 35 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.2 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

## Soil Survey of Santa Fe County Area, New Mexico

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-

Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:*

Common trees: Ponderosa pine

Other plants: Gambel oak, Arizona fescue, muttongrass, elk sedge, ponderosa pine

*Land capability subclass (nonirrigated):* 4c

### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; sandy clay loam

Bt1—4 to 9 inches; sandy clay loam

Bt2—9 to 14 inches; sandy clay loam

Bt3—14 to 25 inches; sandy clay loam

Bt4—25 to 42 inches; clay loam

Bt5—42 to 51 inches; gravelly sandy clay loam

Bt6—51 to 64 inches; gravelly sandy clay loam

Btk—64 to 84 inches; gravelly sandy clay loam

Btk/C—84 to 121 inches; gravelly sandy clay loam

### **Espanola soils**

*Landscape:* Valleys

*Landform:* High stream terraces (fig. 37)

*Position on landform:* Riser

*Parent material:* Alluvium derived from granite, gneiss, and schist

*Slope:* 35 to 85 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 3 percent subrounded boulders; about 2 percent subrounded stones; about 5 percent subrounded cobbles; about 20 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.4 inches (very low)

*Shrink-swell potential:* About 1.9 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:*

Common trees: Ponderosa pine

Other plants: Gambel oak, Arizona fescue, muttongrass, ponderosa pine

*Land capability subclass (nonirrigated):* 3c

### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 8 inches; gravelly sandy clay loam

E/Bt1—8 to 16 inches; extremely gravelly coarse sandy loam

E/Bt2—16 to 31 inches; extremely gravelly coarse sandy loam

Bt—31 to 45 inches; extremely gravelly coarse sandy loam

C1—45 to 54 inches; extremely gravelly loamy coarse sand

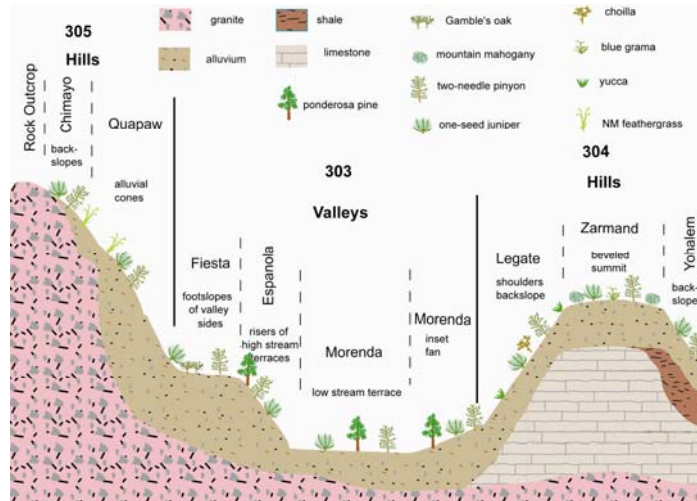
C2—54 to 67 inches; extremely gravelly loamy coarse sand

C3—67 to 80 inches; extremely gravelly loamy coarse sand

**Minor Components Composition**

Enmedio and similar soils: About 3 percent

Riverwash: About 2 percent



**Figure 37.—Cross-section diagram of landform and landform position for map units east and northeast of Santa Fe at higher elevations.**

## **304—Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,200 to 8,500 feet (1,890 to 2,591 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Legate and similar soils: 60 percent

Yohalem and similar soils: 20 percent

Zarmand and similar soils: 15 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Legate soils**

*Landscape:* Foothills (fig. 38 and fig. 39)

*Landform:* Hills (fig. 37)

*Position on landform:* Shoulders, backslopes

*Parent material:* Colluvium derived from limestone

*Slope:* 15 to 45 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 5 percent subrounded boulders; about 2 percent subrounded stones; about 15 percent subrounded cobbles; about 50 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 2.7 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 72 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii

*Potential native vegetation:* twoneedle pinyon, blue grama, oneseed juniper, eriogonum, Bigelow's rubber rabbitbrush

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

Ak—0 to 2 inches; extremely gravelly sandy loam

Bk1—2 to 9 inches; very gravelly fine sandy loam

Bk2—9 to 14 inches; very gravelly sandy loam

Bk3—14 to 18 inches; very gravelly sandy loam

2R—18 to 28 inches; bedrock

#### **Yohalem soils**

*Landscape:* Foothills (fig. 38 and fig. 39)

*Landform:* Hills (fig. 37)

*Position on landform:* Backslopes

## Soil Survey of Santa Fe County Area, New Mexico

*Parent material:* Colluvium derived from shale and limestone over residuum weathered from shale  
*Slope:* 30 to 50 percent  
*Shape (down/across):* Linear/convex  
*Surface fragments:* About 45 percent subrounded gravel; about 5 percent subrounded cobbles  
*Depth class:* Shallow  
*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Available water capacity:* About 2.5 inches (very low)  
*Shrink-swell potential:* About 9.4 percent (very high)  
*Runoff class:* Very high  
*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent  
*Gypsum average in horizon of maximum accumulation:* About 2 percent  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii  
*Potential native vegetation:* twoneedle pinyon, blue grama, oneseed juniper, eriogonum, Bigelow's rubber rabbitbrush  
*Land capability subclass (nonirrigated):* 6e

### **Typical Profile**

A—0 to 1 inch; very gravelly clay loam  
Bw—1 inch to 7 inches; paragravelly clay loam  
BCky—7 to 15 inches; extremely paragravelly clay  
Cr—15 to 25 inches; bedrock

### **Zarmand soils**

*Landscape:* Foothills (fig. 38 and fig. 39)  
*Landform:* Hills (fig. 37)  
*Position on landform:* Beveled summits  
*Parent material:* Alluvium derived from limestone and sandstone over residuum weathered from limestone  
*Slope:* 5 to 15 percent  
*Shape (down/across):* Linear/convex  
*Surface fragments:* About 50 percent subrounded gravel; about 20 percent subrounded cobbles; less than 1 percent subrounded stones  
*Depth class:* Moderately deep  
*Depth to restrictive feature:* 20 to 30 inches to bedrock, paralithic; 20 to 39 inches to bedrock, lithic  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 3.2 inches (low)  
*Shrink-swell potential:* About 2.8 percent (low)  
*Runoff class:* Low  
*Calcium carbonate average in horizon of maximum accumulation:* About 58 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii  
*Potential native vegetation:* twoneedle pinyon, blue grama, oneseed juniper, Gambel oak, eriogonum, Bigelow's rubber rabbitbrush  
*Land capability subclass (nonirrigated):* 7s

***Typical Profile***

A—0 to 1 inch; extremely channery fine sandy loam  
ABk—1 inch to 9 inches; gravelly fine sandy loam  
Bk1—9 to 17 inches; gravelly loam  
2Bk2—17 to 24 inches; paragravelly loam  
2Crk—24 to 29 inches; bedrock  
2R—29 to 39 inches; bedrock

***Minor Components Composition***

Rock outcrop: About 3 percent  
Urban land: About 2 percent



Figure 38.—An area of Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes. The Legate soils have sparse vegetation and many rock fragments.



Figure 39.—An area of Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes. The Yohalem soils have very sparse vegetation with many flat rock fragments covering the surface.

## **305—Chimayo-Rock outcrop-Quapaw complex, 50 to 90 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,100 to 8,100 feet (1,859 to 2,469 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Chimayo and similar soils: 45 percent

Rock outcrop: 25 percent

Quapaw and similar soils: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Chimayo soils**

*Landscape:* Breaks

*Landform:* Hills (fig. 37)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 50 to 90 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 2 percent subrounded boulders; about 3 percent subrounded stones; about 10 percent subrounded cobbles; about 50 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.4 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Mountain Loam

*Potential native vegetation:* Arizona fescue, blue grama, mountain muhly, sedge, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; extremely gravelly coarse sandy loam

Bw—3 to 7 inches; very gravelly coarse sandy loam

2C—7 to 17 inches; cobbles

2R—17 to 27 inches; bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Chimayo soils.

*Landscape:* Breaks

*Landform:* Hills (fig. 37)

*Parent material:* Granite and gneiss

*Slope:* 70 to 190 percent

*Shape (down/across):* Linear/linear

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8s

### **Quapaw soils**

*Landscape:* Breaks

*Landform:* Alluvial cones (fig. 37)

*Parent material:* Colluvium derived from granite, gneiss, and schist

*Slope:* 60 to 80 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 55 percent subrounded gravel; about 10 percent subrounded cobbles; about 1 percent subrounded stones

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.2 inches (low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Mountain Loam

*Potential native vegetation:* Arizona fescue, blue grama, mountain muhly, sedge, twoneedle pinyon

*Land capability subclass (nonirrigated):* 8e

### **Typical Profile**

A—0 to 3 inches; extremely gravelly loam

Bw—3 to 10 inches; very gravelly loam

Bk1—10 to 18 inches; very gravelly sandy loam

Bk2—18 to 28 inches; extremely gravelly coarse sandy loam

Bk3—28 to 44 inches; extremely gravelly sandy loam

BCK1—44 to 55 inches; extremely gravelly coarse sandy loam

BCK2—55 to 80 inches; extremely cobbly coarse sandy loam

### **Minor Components Composition**

Enmedio and similar soils: About 7 percent

Riverwash: About 3 percent



## **306—Adellern gravelly sandy loam, 50 to 90 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 7,400 to 9,100 feet (2,256 to 2,774 meters)

*Mean annual precipitation:* 16 to 20 inches (406 to 508 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 110 to 130 days

### ***Map Unit Composition***

Adellern and similar soils: 95 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Adellern soils**

*Landscape:* Foothills

*Landform:* North-facing high hills

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from schist

*Slope:* 50 to 90 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent angular flagstones; about 5 percent angular channers; about 15 percent subrounded gravel; less than 1 percent subrounded stones

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:*

Common trees: ponderosa pine

Other plants: Gambel oak, mountain muhly, muttongrass

*Land capability subclass (nonirrigated):* 4e

### ***Typical Profile***

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 4 inches; gravelly sandy loam

BA—4 to 8 inches; gravelly sandy loam

Bt1—8 to 21 inches; gravelly sandy clay loam

Bt2—21 to 39 inches; very gravelly sandy clay loam

Bt/BC—39 to 55 inches; very gravelly sandy clay loam

BC/Bt—55 to 65 inches; gravelly sandy loam

2Btb—65 to 73 inches; sandy clay loam

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2Bkb1—73 to 86 inches; sandy loam

2Bkb2—86 to 101 inches; sandy loam

### ***Minor Components Composition***

Zafarano and similar soils: About 3 percent

Rock outcrop: About 2 percent

## **307—Urban land-Ustorthents-Ustarents complex, 1 to 65 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,700 to 7,600 feet (2,042 to 2,316 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Urban land: 45 percent

Ustorthents and similar soils: 30 percent

Ustarents and similar soils: 20 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Urban land**

*Description:* Urban land consists of asphalt highway and frontage road lanes and the steel and concrete of bridges and overpasses. This Urban land is along highway corridor Interstate 25 and U.S. highway 285 where they are cut through granite bedrock.

*Landscape:* Foothills

*Landform:* Hills

*Slope:* 1 to 10 percent

*Shape (down/across):* Linear/linear

*Drainage class:* Well drained

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### **Ustorthents soils**

*Landscape:* Foothills

*Landform:* Hills

*Parent material:* Residuum weathered from granite, gneiss, and schist

*Slope:* 1 to 10 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 80 percent subrounded gravel; about 5 percent subrounded cobbles

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.5 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Land capability subclass (nonirrigated):* 7s

**Typical Profile**

C1—0 to 2 inches; extremely gravelly sandy loam

C2—2 to 30 inches; gravel

R—30 to 40 inches; bedrock

**Ustarents soils**

*Landscape:* Foothills

*Landform:* Hills

*Parent material:* Roadfill derived from granite, gneiss, and schist

*Slope:* 35 to 65 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* Less than 1 percent subrounded stones; about 40 percent subrounded cobbles; about 40 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 11.6 inches (high)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Land capability subclass (nonirrigated):* 8s

**Typical Profile**

A—0 to 2 inches; extremely cobbly sandy loam

C—2 to 80 inches; extremely cobbly sandy loam

**Minor Components Composition**

Enmedio and similar soils: About 2 percent

Antonchico and similar soils: About 1 percent

Atalaya and similar soils: About 1 percent

Setonville and similar soils: About 1 percent

## **308—Enmedio-Zafarano-Rock outcrop complex, 35 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 6,600 to 9,200 feet (2,012 to 2,804 meters)

*Mean annual precipitation:* 15 to 17 inches (381 to 432 millimeters)

*Mean annual air temperature:* 43 to 47 degrees F (6.1 to 8.3 degrees C)

*Frost-free period:* 110 to 150 days

### ***Map Unit Composition***

Enmedio and similar soils: 45 percent

Zafarano and similar soils: 40 percent

Rock outcrop: 10 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Enmedio soils**

*Landscape:* Foothills

*Landform:* South-facing high hills

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 35 to 60 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent subrounded stones; about 10 percent subrounded cobbles; about 40 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 3.2 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Hills

*Potential native vegetation:* oneseed juniper, sideoats grama, black grama, little bluestem

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 7 inches; very gravelly sandy loam

Bt1—7 to 13 inches; very gravelly sandy clay loam

Bt2—13 to 19 inches; extremely gravelly sandy clay loam

BCt—19 to 34 inches; gravel

2C—34 to 48 inches; gravel

2R—48 to 58 inches; cemented bedrock

### **Zafarano soils**

*Landscape:* Foothills

*Landform:* North-facing high hills

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 35 to 60 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 40 percent subrounded gravel; about 5 percent subrounded cobbles; less than 1 percent subrounded stones

*Depth class:* Deep

*Depth to restrictive feature:* 16 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.3 inches (very low)

*Shrink-swell potential:* About 3.0 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:* ponderosa pine, Gambel oak, mountain muhly, muttongrass

*Land capability subclass (nonirrigated):* 7e

#### **Typical Profile**

Oi—0 to 1 inch; slightly decomposed plant material

A1—1 inch to 5 inches; very gravelly sandy loam

A2—5 to 12 inches; extremely gravelly sandy loam

Bt—12 to 20 inches; very gravelly sandy clay loam

2C1—20 to 31 inches; gravel

2C2—31 to 43 inches; gravel

2R—43 to 53 inches; bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Lazaro soils.

*Landscape:* Foothills

*Landform:* High hills

*Position on landform:* Backslopes

*Parent material:* Granite and gneiss

*Slope:* 30 to 160 percent

*Shape (down/across):* Linear/linear

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8s

#### **Minor Components Composition**

Lazaro, steep and similar soils: About 2 percent

Urban land: About 1 percent

Lazaro, rolling and similar soils: About 1 percent

Atalaya and similar soils: About 1 percent

### **309—Lazaro complex, 5 to 45 percent slopes**

#### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 7,300 to 9,000 feet (2,225 to 2,743 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 45 to 47 degrees F (7.2 to 8.3 degrees C)

*Frost-free period:* 120 to 140 days

#### ***Map Unit Composition***

Lazaro, steep and similar soils: 65 percent

Lazaro, rolling and similar soils: 25 percent

Minor components: 10 percent

#### ***Component Descriptions***

##### **Lazaro, steep soils**

*Landscape:* Foothills

*Landform:* High hills

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 30 to 45 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 35 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 12 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.4 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:* ponderosa pine, Gambel oak, Arizona fescue, muttongrass, blue grama, sedge

*Land capability subclass (nonirrigated):* 7e

#### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A1—1 inch to 4 inches; very gravelly coarse sandy loam

A2—4 to 16 inches; extremely gravelly coarse sandy loam

2C1—16 to 30 inches; gravel

2C2—30 to 50 inches; gravel

2R—50 to 60 inches; cemented bedrock

**Lazaro, rolling soils**

*Landscape:* Foothills

*Landform:* High hills

*Position on landform:* Beveled summits, shoulders

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 0 percent subrounded cobbles; about 30 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 10 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 1.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:* ponderosa pine, Gambel oak, Arizona fescue, muttongrass, blue grama, sedge

*Land capability subclass (nonirrigated):* 7s

**Typical Profile**

A1—0 to 2 inches; gravelly sandy loam

A2—2 to 5 inches; very gravelly coarse sandy loam

C1—5 to 12 inches; extremely gravelly loamy coarse sand

2C2—12 to 25 inches; gravel

2C3—25 to 43 inches; gravel

2Ct—43 to 45 inches; gravel

2R—45 to 55 inches; cemented bedrock

**Minor Components Composition**

Rock outcrop: About 5 percent

Zafarano and similar soils: About 3 percent

Enmedio and similar soils: About 2 percent



## **310—Santa Fe-Rock outcrop complex, 25 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 7,200 to 8,400 feet (2,195 to 2,560 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Santa Fe and similar soils: 60 percent

Rock outcrop: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Santa Fe soils**

*Landscape:* Foothills (fig. 40)

*Landform:* High hills (fig. 36)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from granite, gneiss, and schist over residuum weathered from granite

*Slope:* 25 to 45 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 30 percent subrounded gravel; about 25 percent subrounded cobbles; less than 1 percent subrounded stones

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 3.7 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii

*Potential native vegetation:* sideoats grama, twoneedle pinyon, black grama, little bluestem, Gambel oak, blue grama

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 7 inches; very cobbly fine sandy loam

Bt1—7 to 11 inches; very gravelly sandy clay loam

Bt2—11 to 14 inches; extremely gravelly sandy clay loam

2R—14 to 24 inches; bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Santa Fe soils.

*Landscape:* Foothills (fig. 40)

*Landform:* High hills (fig. 36)

*Parent material:* Granite and gneiss

*Slope:* 40 to 180 percent

*Shape (down/across):* Convex/convex

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8s

### **Minor Components Composition**

Enmedio and similar soils: About 5 percent

Sanctuario and similar soils: About 3 percent

Atalaya and similar soils: About 2 percent



**Figure 40.—An area of Santa Fe-Rock outcrop complex, 25 to 45 percent slopes. Many of the piñon trees have died in the recent drought and because of the effects of the bark beetle.**

## **400—Chiminet-Canuela-Rock outcrop complex, 2 to 20 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,900 to 7,100 feet (1,798 to 2,164 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Canuela and similar soils: 30 percent

Chiminet and similar soils: 25 percent

Rock outcrop: 20 percent

Chiminet, thick surface and similar soils: 15 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Chiminet soils**

*Landscape:* Lava plateaus (fig. 41)

*Landform:* Interfluves on undulating plateaus, interfluves on mesas (fig. 42)

*Position on landform:* Shoulders, backslopes

*Parent material:* Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 8 to 20 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* Less than 1 percent subangular boulders; about 10 percent subangular cobbles; less than 1 percent subangular stones; about 15 percent angular gravel

*Depth class:* Very shallow

*Depth to restrictive feature:* 4 to 10 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.6 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 2 inches; paracobbly ashy coarse sandy loam

2Bw—2 to 6 inches; very paracobbly ashy coarse sandy loam

2Cr—6 to 16 inches; cemented bedrock

**Chiminet, thick surface soils**

*Landscape:* Lava plateaus (fig. 41)

*Landform:* Interfluves on undulating plateaus, interfluves on mesas (fig. 42)

*Position on landform:* Backslopes, shoulders

*Parent material:* Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/linear, convex

*Surface fragments:* About 5 percent angular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 6s

**Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 5 inches; ashy coarse sandy loam

Bw1—5 to 10 inches; paragravelly ashy coarse sandy loam

2Bw2—10 to 15 inches; very paracobbly ashy coarse sandy loam

2Cr—15 to 25 inches; cemented bedrock

**Canuela soils**

*Landscape:* Lava plateaus (fig. 41)

*Landform:* Interfluves on undulating plateaus, interfluves on mesas (fig. 42)

*Position on landform:* Summits

*Parent material:* Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff

*Slope:* 2 to 6 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 15 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

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*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-  
Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, skunkbush sumac,  
twoneedle pinyon, mountain mahogany, needleandthread

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

A—0 to 2 inches; paragravelly fine sandy loam

Bt1—2 to 7 inches; paragravelly clay loam

2Bt2—7 to 15 inches; very paracobbly sandy clay loam

2Cr—15 to 25 inches; cemented bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed tuff bedrock. It occurs as gently sloping bedrock and knobs intermingled with the Chiminet and Chiminet, thick surface, soils.

*Landscape:* Lava plateaus (fig. 41)

*Landform:* Mesas, plateaus (fig. 42)

*Parent material:* Rhyolitic tuff

*Slope:* 5 to 25 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* 0 inches to bedrock, lithic

*Runoff class:* High

*Land capability subclass (nonirrigated):* 8

### **Minor Components Composition**

Andanada and similar soils: About 5 percent

Nyjack and similar soils: About 3 percent

Adornado and similar soils: About 1 percent

Hackroy and similar soils: About 1 percent



Figure 41.—An area of Chiminet-Canuela-Rock outcrop complex, 2 to 20 percent slopes on Frijoles Mesa. The Canuela soils are on the open area on summits. The Chiminets have a thick surface and are on areas under the tree canopy.

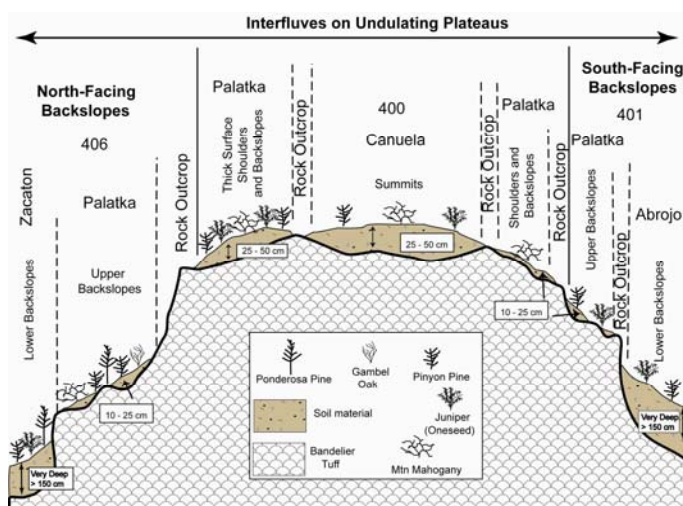


Figure 42.—Cross-section diagram of landform and landform position for map units of plateaus on Tsankawi and low elevations of Bandelier east and south of Los Alamos.

## **401—Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,200 feet (1,737 to 2,195 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Rock outcrop: 40 percent

Abrojo and similar soils: 30 percent

Chiminet and similar soils: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed tuff and tuff breccia bedrock. It occurs as steeply sloping bedrock and vertical cliffs intermingled with the Chiminet soil and above the Abrojo soil.

*Landscape:* Lava plateaus (fig. 43)

*Landform:* Undulating mesas, plateaus, canyons (fig. 42 and fig. 45)

*Parent material:* Rhyolitic tuff

*Slope:* 35 to 160 percent

*Shape (down/across):* Concave/linear

*Depth to restrictive feature:* At the surface bedrock, lithic

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8

#### **Abrojo soils**

*Landscape:* Lava plateaus (fig. 43)

*Landform:* Undulating plateaus, mesas, canyons, south-facing plateaus, mesas, canyons (fig. 42 and fig. 45)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 25 to 65 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 10 percent subangular boulders; about 4 percent subangular stones; about 30 percent subangular gravel; about 25 percent subangular cobbles

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.4 inches (low)

*Shrink-swell potential:* About 1.1 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 4 mmhos/cm (very slightly saline)

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*Sodium adsorption ratio average in horizon of maximum accumulation:* About 22  
(moderately sodic)

*Ecological site:* Hills

*Potential native vegetation:* blue grama, oneseed juniper, skunkbush sumac, black grama, galleta

*Land capability subclass (nonirrigated):* 8

### **Typical Profile**

A—0 to 2 inches; extremely cobbly ashy loamy coarse sand (fig. 28)

C1—2 to 9 inches; very gravelly ashy loamy coarse sand

C2—9 to 23 inches; very gravelly ashy loamy coarse sand

C3—23 to 30 inches; very cobbly ashy loamy coarse sand

2C4—30 to 64 inches; ashy loamy sand

3C5—64 to 80 inches; gravelly ashy loamy coarse sand

### **Chiminet soils**

*Landscape:* Lava plateaus (fig. 43)

*Landform:* Undulating plateaus, mesas, canyons (fig. 42 and fig. 45)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 25 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent subrounded stones

*Depth class:* Very shallow

*Depth to restrictive feature:* 6 to 10 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 0.5 inches (very low)

*Shrink-swell potential:* About 0.0 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-  
Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, Indian ricegrass, blue grama, twoneedle pinyon, skunkbush sumac, true mountain mahogany

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 2 inches; paracobbly ashy loamy coarse sand (fig. 28)

2C—2 to 7 inches; paragravelly ashy loamy coarse sand

2Cr—7 to 17 inches; cemented bedrock

### **Minor Components Composition**

Canuela and similar soils: About 7 percent

Piojillo and similar soils: About 3 percent





**Figure 43.—An area of Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes, in Alamo Canyon, is the right foreground. An area of Metate loam, 0 to 3 percent slopes, is on the canyon bottom with tall ponderosa pines.**

## **402—Navajita complex, 2 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,900 feet (1,768 to 2,103 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Navajita and similar soils: 60 percent

Navajita, thick surface and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Navajita soils**

*Landscape:* Lava plateaus

*Landform:* North-facing valley sides (fig. 45)

*Position on landform:* Toeslopes, footslopes

*Parent material:* Eolian deposits and slope alluvium derived from rhyolitic tuff

*Slope:* 6 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.3 inches (moderate)

*Shrink-swell potential:* About 3.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-  
Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, muttongrass, twoneedle  
pinyon

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; loam

BA—2 to 5 inches; loam

Btk1—5 to 13 inches; loam

Btk2—13 to 22 inches; sandy clay loam

2Btk3—22 to 32 inches; sandy clay loam

2BCt—32 to 42 inches; coarse sandy loam

3Bk—42 to 63 inches; paragravelly coarse sandy loam

3C—63 to 110 inches; paragravelly loamy coarse sand

**Navajita, thick surface soils**

*Landscape:* Lava plateaus

*Landform:* North-facing valley sides

*Position on landform:* Toeslopes, footslopes

*Parent material:* Eolian deposits and slope alluvium derived from rhyolitic tuff

*Slope:* 2 to 10 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.9 inches (moderate)

*Shrink-swell potential:* About 3.1 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, muttongrass, twoneedle  
pinyon

*Land capability subclass (nonirrigated):* 4c

**Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 8 inches; sandy loam

Bt1—8 to 22 inches; sandy loam

Bt2—22 to 29 inches; sandy clay loam

Btk1—29 to 38 inches; sandy clay loam

Btk2—38 to 57 inches; sandy loam

BC—57 to 80 inches; paragravelly sandy loam

**Minor Components Composition**

Zacaton and similar soils: About 4 percent

Piojillo and similar soils: About 3 percent

Abrojo and similar soils: About 2 percent

Gullied land: About 1 percent

## **403—Piojillo paragravelly ashy loamy coarse sand, 3 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,200 feet (1,737 to 2,195 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Piojillo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Piojillo soils**

*Landscape:* Lava plateaus

*Landform:* South-facing valley sides (fig. 45)

*Position on landform:* Toeslopes, footslopes

*Parent material:* Slope alluvium derived from volcanic ash and pumice

*Slope:* 3 to 15 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 20 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 1.4 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis/Rhus trilobata/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, blue grama, twoneedle pinyon, black grama

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A1—0 to 3 inches; paragravelly ashy loamy coarse sand

A2—3 to 6 inches; paragravelly ashy loamy coarse sand

Bw1—6 to 10 inches; paragravelly ashy loamy coarse sand

Bw2—10 to 21 inches; ashy loamy coarse sand

C1—21 to 35 inches; paragravelly ashy loamy coarse sand

C2—35 to 84 inches; paragravelly ashy loamy coarse sand

C3—84 to 110 inches; paragravelly ashy loamy coarse sand

### ***Minor Components Composition***

Navajita and similar soils: About 4 percent

Abrojo and similar soils: About 3 percent

Totavi and similar soils: About 2 percent

Zacaton and similar soils: About 1 percent

## **404—Totavi ashy loamy coarse sand, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,000 feet (1,676 to 2,134 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Totavi and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Totavi soils**

*Landscape:* Lava plateaus (fig. 44)

*Landform:* Low stream terraces on valley floors (fig. 45)

*Position on landform:* Tread

*Parent material:* Alluvium derived from latite, dacite, and rhyolitic tuff

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 4.6 inches (low)

*Shrink-swell potential:* About 0.8 percent (low)

*Flooding hazard:* Very rare

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, Rocky Mountain juniper, blue grama, needleandthread

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A1—0 to 3 inches; ashy loamy coarse sand

A2—3 to 31 inches; ashy coarse sand

2C1—31 to 52 inches; gravelly ashy loamy sand

3C2—52 to 80 inches; gravelly ashy coarse sand

### ***Minor Components Composition***

Navajita and similar soils: About 7 percent

Piojillo and similar soils: About 5 percent

Riverwash: About 3 percent



Figure 44.—An area of Totavi ashy loamy coarse sand, 1 to 3 percent slopes in Sandia Canyon.

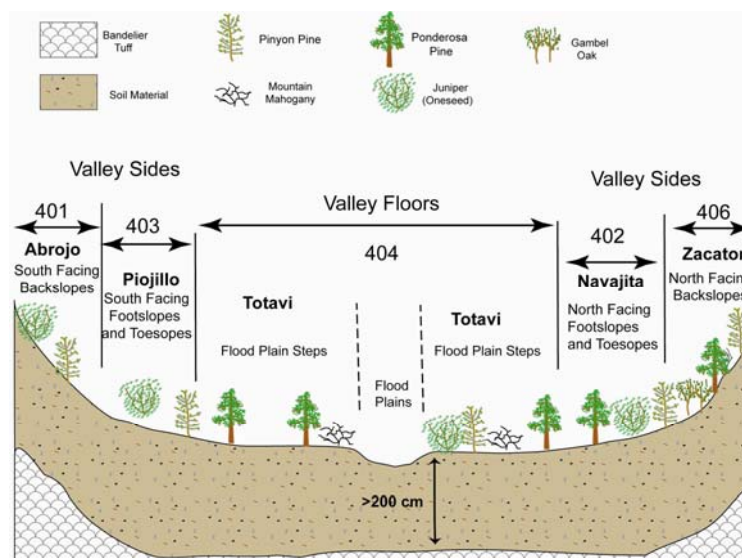


Figure 45.—Cross-section diagram of landform and landform position for map units of valley floors and sides in inter-plateau valleys without perennial streams east of Los Alamos.

## **405—Espiritu-Pedregal complex, 3 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,900 feet (1,768 to 2,103 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Espiritu and similar soils: 50 percent

Pedregal and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Espiritu soils**

*Landscape:* Lava plateaus (fig. 46)

*Landform:* High stream terraces

*Position on landform:* Riser

*Parent material:* Alluvium derived from latite, dacite, and rhyolitic tuff

*Slope:* 25 to 50 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 2 percent subangular stones; about 65 percent subangular gravel; about 10 percent subangular cobbles

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 8.5 inches (moderate)

*Shrink-swell potential:* About 3.3 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, Gambel oak, twoneedle pinyon, blue grama

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; extremely gravelly coarse sandy loam

Bt1—3 to 6 inches; very gravelly sandy clay loam

Bt2—6 to 11 inches; very gravelly sandy clay loam

Bt3—11 to 16 inches; very gravelly coarse sandy loam

2Bt4—16 to 23 inches; loam

2Bt5—23 to 44 inches; loam

2BC—44 to 80 inches; loam

### **Pedregal soils**

*Landscape:* Lava plateaus (fig. 46)

*Landform:* High stream terraces

*Position on landform:* Tread

*Parent material:* Alluvium derived from latite, dacite, and rhyolitic tuff

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to strongly contrasting textural stratification; 20 to 39 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 2.4 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 48 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, Gambel oak, twoneedle pinyon, blue grama, skunkbush sumac

*Land capability subclass (nonirrigated):* 4c

### **Typical Profile**

A—0 to 3 inches; gravelly loam

Bt1—3 to 6 inches; clay loam

Bt2—6 to 9 inches; clay loam

Bk1—9 to 13 inches; gravelly loam

Bk2—13 to 17 inches; gravelly sandy loam

2Bk3—17 to 22 inches; very gravelly loamy coarse sand

2Bk4—22 to 26 inches; very gravelly coarse sand

2Bkqm—26 to 34 inches; cemented material

2Bk5—34 to 41 inches; extremely gravelly loamy coarse sand

2C—41 to 70 inches; sandy loam

### **Minor Components Composition**

Navajita and similar soils: About 5 percent

Piojillo and similar soils: About 3 percent

Totavi and similar soils: About 2 percent





**Figure 46.—An area of Espiritu-Pedregal complex, 3 to 50 percent slopes near Los Alamos Canyon. The Pedregal soils are on the flat summit positions.**

## **406—Rock outcrop-Zacaton-Chiminet complex, 25 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,100 feet (1,676 to 2,164 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Rock outcrop: 40 percent

Zacaton and similar soils: 30 percent

Chiminet and similar soils: 25 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed tuff and tuff breccia bedrock. It occurs as steeply sloping bedrock and vertical cliffs intermingled with the Chiminet soil and above the Zacaton soil.

*Landscape:* Lava plateaus (fig. 47)

*Landform:* Canyons, mesas, plateaus (fig. 42 and fig. 45)

*Parent material:* Rhyolitic tuff

*Slope:* 35 to 180 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* At the surface bedrock, lithic

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8s

#### **Zacaton soils**

*Landscape:* Lava plateaus (fig. 47)

*Landform:* Lower canyons, mesas, plateaus (fig. 42 and fig. 45)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 25 to 50 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 25 percent subangular gravel; about 8 percent subangular stones; about 5 percent subangular boulders; about 25 percent subangular cobbles

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 7.3 inches (moderate)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 16 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 11 (slightly sodic)

## Soil Survey of Santa Fe County Area, New Mexico

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, muttongrass, Indian ricegrass

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

Oi—0 to 1 inch; slightly decomposed plant material  
A—1 inch to 3 inches; very cobbly ashy sandy loam  
Bw—3 to 9 inches; cobbly ashy sandy loam  
Bk1—9 to 18 inches; very gravelly ashy sandy loam  
Bk2—18 to 32 inches; very cobbly ashy loam  
Bk3—32 to 48 inches; cobbly ashy sandy loam  
2Bk4—48 to 63 inches; gravelly ashy sandy loam  
2Bk5—63 to 76 inches; gravelly ashy loamy coarse sand  
2C—76 to 102 inches; gravelly ashy loamy coarse sand

### **Chiminet soils**

*Landscape:* Lava plateaus (fig. 47)

*Landform:* Upper canyons, mesas, plateaus (fig. 42 and fig. 45)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 35 to 60 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent subangular gravel; about 1 percent subangular stones; about 2 percent subangular boulders

*Depth class:* Very shallow

*Depth to restrictive feature:* 6 to 10 inches to bedrock, paralithic

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Greater than 20 in/hr (very rapid)

*Available water capacity:* About 0.6 inches (very low)

*Shrink-swell potential:* About 1.2 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

Oi—0 to 1 inch; slightly decomposed plant material  
A—1 inch to 2 inches; ashy loamy sand  
AB—2 to 5 inches; ashy loamy sand  
Bw—5 to 7 inches; paragravelly ashy loamy sand  
2Cr—7 to 17 inches; cemented bedrock

***Minor Components Composition***

Navajita and similar soils: About 3 percent

Canuela and similar soils: About 2 percent



**Figure 47.—An area of Rock outcrop-Zacaton-Chiminet complex, 25 to 60 percent slopes in Canon de los Frijoles. The robust vegetation contrasts the sparse vegetation of the opposing south-facing slopes.**

## **407—Rock outcrop-Chiminet complex, 20 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 6,800 feet (1,829 to 2,073 meters)

*Mean annual precipitation:* 12 to 16 inches (305 to 406 millimeters)

*Mean annual air temperature:* 47 to 50 degrees F (8.3 to 10.0 degrees C)

*Frost-free period:* 130 to 160 days

### ***Map Unit Composition***

Rock outcrop: 55 percent

Chiminet and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed tuff bedrock. It occurs as steeply sloping bedrock, short cliffs, and knobs intermingled with the Chiminet soil.

*Landscape:* Lava plateaus (fig. 48)

*Landform:* Plateaus (fig. 54)

*Parent material:* Rhyolitic tuff

*Slope:* 30 to 140 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* 0 inches to bedrock, lithic

*Runoff class:* Very high

*Land capability subclass (nonirrigated):* 8s

#### **Chiminet soils**

*Landscape:* Lava plateaus (fig. 48)

*Landform:* Undulating plateaus (fig. 54)

*Position on landform:* Shoulders, backslopes

*Parent material:* Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 20 to 50 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 20 percent subangular gravel; about 5 percent subangular stones; about 5 percent subangular boulders; about 5 percent subangular cobbles

*Depth class:* Very shallow

*Depth to restrictive feature:* 6 to 10 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

## Soil Survey of Santa Fe County Area, New Mexico

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 3 inches; paragravelly ashy coarse sandy loam

2Bw—3 to 8 inches; very paracobbly ashy coarse sandy loam

2Cr—8 to 18 inches; cemented bedrock

### **Minor Components Composition**

Canuela and similar soils: About 5 percent

Abrojo and similar soils: About 3 percent

Zacaton and similar soils: About 2 percent



**Figure 48.—An area of Rock outcrop-Chiminet complex, 20 to 50 percent slopes on Frijoles Mesa.**

## **408—Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,400 to 7,000 feet (1,951 to 2,134 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Adornado and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Adornado soils**

*Landscape:* Lava plateaus (fig. 49)

*Landform:* Interfluves on undulating plateaus

*Position on landform:* Backslopes, footslopes

*Parent material:* Slope alluvium derived from pumice

*Slope:* 8 to 15 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 35 percent subangular gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to abrupt textural change; 59 to 79 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.1 inches (low)

*Shrink-swell potential:* About 0.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:* ponderosa pine, Gambel oak, little bluestem, blue grama, bottlebrush squirreltail, Rocky Mountain juniper

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 3 inches; very paragravelly ashy coarse sandy loam (fig. 50)

Bw1—3 to 9 inches; very paragravelly ashy coarse sandy loam

Bw2—9 to 17 inches; extremely paragravelly ashy coarse sandy loam

Bk—17 to 23 inches; extremely paragravelly ashy coarse sand

2E and Bt1—23 to 42 inches; extremely paragravelly ashy coarse sand

2E and Bt2—42 to 72 inches; extremely paragravelly ashy coarse sand

3Ab—72 to 78 inches; very fine sandy loam

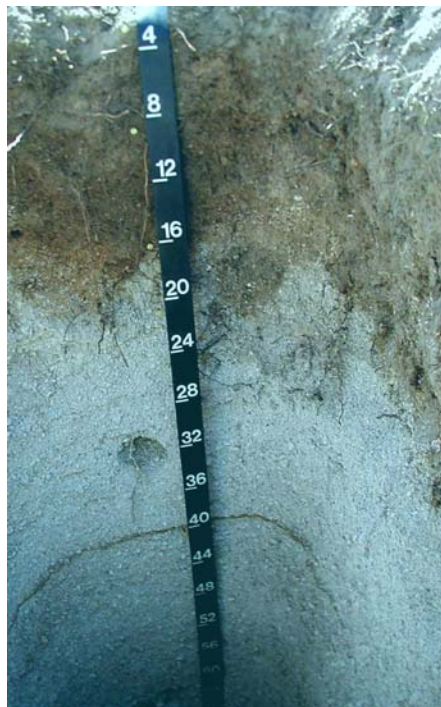
3Btb—78 to 104 inches; sandy clay loam

***Minor Components Composition***

Nyjack and similar soils: About 7 percent  
Navajita and similar soils: About 2 percent  
Canuela and similar soils: About 1 percent



**Figure 49.**—An area of Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes near Juniper Campground. This pumice derived soil supports a stand of ponderosa pine trees in a moisture regime that commonly has piñon and juniper.



**Figure 50.**—Typical profile of Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes. Pumice begins at about 20 cm.



## **409—Hackroy-Nyjack complex, 2 to 12 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,400 to 7,000 feet (1,951 to 2,134 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Hackroy and similar soils: 35 percent

Nyjack and similar soils: 30 percent

Hackroy, thick surface and similar soils: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Hackroy soils**

*Landscape:* Lava plateaus (fig. 51)

*Landform:* Interfluves on undulating plateaus

*Position on landform:* Shoulders

*Parent material:* Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff

*Slope:* 5 to 12 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 2.5 inches (very low)

*Shrink-swell potential:* About 8.0 percent (high)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, Gambel oak, blue grama, twoneedle pinyon, muhly

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 3 inches; loam

Bt1—3 to 9 inches; clay

2Bt2—9 to 16 inches; very paracobbly clay

2Cr—16 to 26 inches; cemented bedrock

**Hackroy, thick surface soils**

*Landscape:* Lava plateaus (fig. 51)

*Landform:* Interfluves on undulating plateaus

*Position on landform:* Summits

*Parent material:* Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 8 to 18 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 5.1 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, broom snakeweed, plains prickly pear, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

**Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 5 inches; fine sandy loam

AB—5 to 9 inches; fine sandy loam

Bt1—9 to 16 inches; clay loam

2Bt2—16 to 19 inches; paracobbly clay

2Cr—19 to 29 inches; cemented bedrock

**Nyjack soils**

*Landscape:* Lava plateaus (fig. 51)

*Landform:* Interfluves on undulating plateaus

*Position on landform:* Summits

*Parent material:* Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff

*Slope:* 2 to 6 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change; 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 6.1 inches (moderate)

*Shrink-swell potential:* About 3.7 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-  
Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, twoneedle pinyon, big  
sagebrush

*Land capability subclass (nonirrigated):* 4s

#### **Typical Profile**

A—0 to 2 inches; loam

Bt1—2 to 12 inches; clay loam

Bt2—12 to 20 inches; clay loam

BCt—20 to 28 inches; sandy clay loam

2C—28 to 32 inches; very paragravelly loam

2Cr—32 to 42 inches; cemented bedrock

#### **Minor Components Composition**

Canuela and similar soils: About 7 percent

Navajita and similar soils: About 2 percent

Rock outcrop: About 1 percent



**Figure 51.—An area of Hackroy-Nyjack complex, 2 to 12 percent slopes on Frijoles Mesa.**

## **410—Chiminet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 6,800 feet (1,859 to 2,073 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.5 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Chiminet and similar soils: 30 percent

Canuela and similar soils: 25 percent

Rock outcrop: 20 percent

Chiminet, thick surface and similar soils: 15 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Chiminet soils**

*Landscape:* Lava plateaus (fig. 52 and fig. 53)

*Landform:* Interfluves on undulating plateaus (fig. 54)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 8 to 15 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 20 percent subangular gravel; about 5 percent subangular cobbles; about 2 percent subangular stones

*Depth class:* Very shallow

*Depth to restrictive feature:* 6 to 10 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 0.9 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 3 inches; paragravelly ashy sandy loam

2Bw—3 to 8 inches; very paracobbly ashy sandy loam

2Cr—8 to 18 inches; cemented bedrock

**Chiminet, thick surface soils**

*Landscape:* Lava plateaus (fig. 52 and fig. 53)

*Landform:* Interfluves on undulating plateaus (fig. 54)

*Position on landform:* Backslopes, shoulders

*Parent material:* Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 3 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama

*Land capability subclass (nonirrigated):* 6s

**Typical Profile**

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 3 inches; ashy sandy loam

Bw1—3 to 7 inches; paragravelly ashy sandy loam

2Bw2—7 to 14 inches; very paracobbly ashy sandy loam

2Cr—14 to 24 inches; cemented bedrock

**Canuela soils**

*Landscape:* Lava plateaus (fig. 52 and fig. 53)

*Landform:* Interfluves on undulating plateaus (fig. 54)

*Position on landform:* Summits

*Parent material:* Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, skunkbush sumac, twoneedle pinyon, mountain mahogany, needleandthread

*Land capability subclass (nonirrigated):* 4s

#### **Typical Profile**

A—0 to 2 inches; sandy loam

Bt—2 to 7 inches; loam

2Btk—7 to 16 inches; very paracobbly loam

2Cr—16 to 26 inches; cemented bedrock

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed tuff bedrock. It occurs as gently sloping bedrock and knobs intermingled with the Chiminet and Chiminet, thick surface, soils.

*Landscape:* Lava plateaus (fig. 52 and fig. 53)

*Landform:* Interfluvies on undulating plateaus (fig. 54)

*Parent material:* Rhyolitic tuff

*Slope:* 5 to 25 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* At the surface bedrock, lithic

*Runoff class:* High

*Land capability subclass (nonirrigated):* 8s

#### **Minor Components Composition**

Hackroy and similar soils: About 5 percent

Nyjack and similar soils: About 3 percent

Chiminet and similar soils: About 2 percent



**Figure 52.—An area of Chiminet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes, near Lummis Canyon. The Chiminet soils are on shoulder positions.**



Figure 53.—An area of Chiminiet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes, near Lummis Canyon. The Canuela soils are on this summit position.

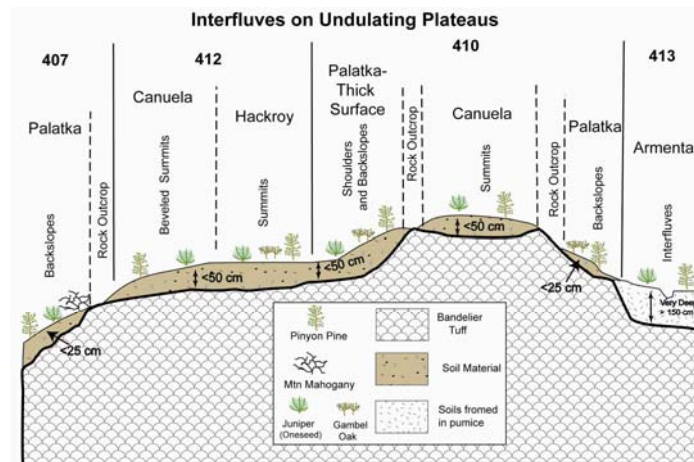


Figure 54.—Cross-section diagram of landform and landform position for map units of plateaus on the lowest elevations of Bandelier, southeast of Los Alamos.

## **412—Canuela-Hackroy complex, 1 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 6,500 feet (1,859 to 1,981 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.5 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Canuela and similar soils: 50 percent

Hackroy and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Canuela soils**

*Landscape:* Lava plateaus (fig. 55)

*Landform:* Interfluves on undulating plateaus (fig. 54)

*Position on landform:* Summits

*Parent material:* Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 11 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-

Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, skunkbush sumac, twoneedle pinyon, mountain mahogany, needleandthread

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A—0 to 3 inches; sandy loam

Bt1—3 to 6 inches; loam

Bt2—6 to 10 inches; clay loam

2Btk—10 to 17 inches; very paracobbly loam

2Cr—17 to 27 inches; cemented bedrock

#### **Hackroy soils**

*Landscape:* Lava plateaus (fig. 55)

*Landform:* Interfluves on undulating plateaus (fig. 54)

*Position on landform:* Summits



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*Parent material:* Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff  
*Slope:* 1 to 5 percent  
*Shape (down/across):* Linear/linear  
*Surface fragments:* About 5 percent subangular gravel  
*Depth class:* Shallow  
*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.06 to 0.2 in/hr (slow)  
*Available water capacity:* About 2.6 inches (very low)  
*Shrink-swell potential:* About 6.6 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 8 mmhos/cm (slightly saline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis  
*Potential native vegetation:* oneseed juniper, blue grama, broom snakeweed, plains prickly pear, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 4s

### **Typical Profile**

A—0 to 3 inches; fine sandy loam  
Bt1—3 to 8 inches; clay  
Bt2—8 to 12 inches; clay  
2Btk—12 to 19 inches; paracobbly sandy clay loam  
2Cr—19 to 29 inches; cemented bedrock

### **Minor Components Composition**

Chiminet and similar soils: About 6 percent  
Rock outcrop: About 4 percent



**Figure 55.—An area of Canuela-Hackroy complex, 1 to 8 percent slopes, near Lummis Canyon.**

## **413—Armenta very paragravelly ashy coarse sand, 3 to 20 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,000 feet (1,646 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.5 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Armenta and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Armenta soils**

*Landscape:* Lava plateaus (fig. 56)

*Landform:* Interfluvies on undulating plateaus (fig. 54)

*Position on landform:* Backslopes, footslopes

*Parent material:* Slope alluvium derived from pumice

*Slope:* 3 to 20 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 55 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 3.3 inches (low)

*Shrink-swell potential:* About 0.2 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Pinus edulis/Rhus trilobata/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, skunkbush sumac, Apache plume, blue grama

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A—0 to 2 inches; very paragravelly ashy coarse sand

Bw—2 to 10 inches; very paragravelly ashy coarse sandy loam

Bk—10 to 13 inches; very paragravelly ashy coarse sand

E and Bt—13 to 55 inches; extremely paragravelly ashy coarse sand

C—55 to 80 inches; extremely paragravelly ashy coarse sand

### ***Minor Components Composition***

Chiminet and similar soils: About 7 percent

Canuela and similar soils: About 3 percent



**Figure 56.—An area of Armenta very paragravelly ashy coarse sand, 3 to 20 percent slopes, near Lummis Canyon. The pumice derived Armenta soils have a white surface that has a sharp contrast with the darker surface. Chiminet soils are in the foreground.**

## **414—Metate loam, 0 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,200 to 6,800 feet (1,890 to 2,073 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 47 to 49 degrees F (8.3 to 9.4 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Metate and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Metate soils**

*Landscape:* Lava plateaus (fig. 43 and fig. 57)

*Landform:* Flood plain steps on valley floors

*Position on landform:* Tread

*Parent material:* Alluvium derived from dacite and rhyolitic tuff

*Slope:* 0 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 6.1 inches (moderate)

*Shrink-swell potential:* About 1.1 percent (low)

*Flooding hazard:* Rare

*Seasonal high water table depth:* About 24 to 42 inches

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Populus fremontii/Salix exigua-Salix/Carex

*Potential native vegetation:* cottonwood, blue grama, bottlebrush squirreltail, Gambel oak, Rocky Mountain maple, ponderosa pine

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

A1—0 to 3 inches; ashy loam

A2—3 to 8 inches; ashy loam

A3—8 to 17 inches; ashy loam

AC—17 to 28 inches; ashy loamy sand

C1—28 to 33 inches; stratified ashy coarse sand to ashy sandy loam

C2—33 to 44 inches; stratified ashy coarse sand to sandy loam

2C3—44 to 70 inches; extremely gravelly coarse sand

***Minor Components Composition***

Espiritu and similar soils: About 2 percent  
Navajita and similar soils: About 2 percent  
Pedregal and similar soils: About 2 percent  
Piojillo and similar soils: About 2 percent  
Riverwash: About 1 percent  
Water: About 1 percent



**Figure 57.—An area of Metate loam, 0 to 3 percent slopes, in Canon de los Frijoles, near the visitor center.**

## **500—Sedillo very gravelly loam, 2 to 6 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,400 feet (1,676 to 2,256 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Sedillo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Sedillo soils**

*Landscape:* Fan piedmonts (fig. 58 and fig. 59)

*Landform:* Fan remnants (fig. 60)

*Position on landform:* Tread

*Parent material:* Alluvium derived from monzonite

*Slope:* 2 to 6 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent subrounded cobbles; about 35 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 2.7 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 27 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, blue grama, twoneedle pinyon, sideoats grama, banana yucca

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

A—0 to 4 inches; very gravelly loam

Bt—4 to 11 inches; very gravelly clay loam

Btk—11 to 19 inches; very cobbly clay loam

Bk1—19 to 31 inches; extremely cobbly loam

Bk2—31 to 43 inches; extremely cobbly sandy loam

BCK—43 to 102 inches; extremely cobbly coarse sand

### ***Minor Components Composition***

Cerrillos and similar soils: About 4 percent

Ildefonso and similar soils: About 3 percent

Truehill and similar soils: About 3 percent



**Figure 58.—An area of Sedillo very gravelly loam, 2 to 6 percent slopes.**



**Figure 59.—An area of Sedillo very gravelly loam, 2 to 6 percent slopes. There are many rock fragments throughout the soil.**



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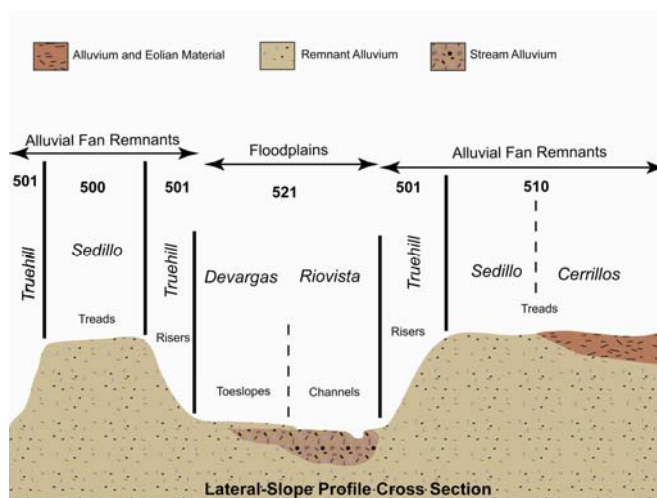


Figure 60.—Cross-section diagram of landform and landform position for remnant alluvial soils of the Ortiz, San Pedro, and South Mountain system.



## **501—Truehill extremely gravelly loam, 25 to 55 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 7,400 feet (1,676 to 2,256 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Truehill and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Truehill soils**

*Landscape:* Fan piedmonts

*Landform:* Fan remnants (fig. 60)

*Position on landform:* Riser

*Parent material:* Alluvium derived from monzonite

*Slope:* 25 to 55 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent well rounded stones; about 15 percent well rounded cobbles; about 41 percent well rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 2.8 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 40 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 8

### ***Typical Profile***

A—0 to 4 inches; extremely gravelly loam

Bt—4 to 7 inches; very gravelly clay loam

Btk—7 to 12 inches; very gravelly clay loam

Bk1—12 to 22 inches; extremely cobbly sandy loam

Bk2—22 to 40 inches; extremely gravelly coarse sandy loam

Bk3—40 to 49 inches; extremely gravelly coarse sand

Bk4—49 to 67 inches; extremely gravelly sandy clay loam

Bk5—67 to 80 inches; extremely gravelly loamy coarse sand

***Minor Components Composition***

Ildefonso and similar soils: About 5 percent  
Ceropelon and similar soils: About 2 percent  
Sedillo and similar soils: About 2 percent  
Rock outcrop: About 1 percent

## **502—Khapo fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,800 feet (1,676 to 2,073 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Khapo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Khapo soils**

*Landscape:* Semi-bolsos

*Landform:* Eroded fan remnants

*Position on landform:* Toeslopes

*Parent material:* Eolian deposits derived from sandstone and shale over slope alluvium derived from monzonite

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.5 inches (moderate)

*Shrink-swell potential:* About 2.9 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; fine sandy loam

Bt—3 to 8 inches; fine sandy loam

Btk1—8 to 27 inches; fine sandy loam

Btk2—27 to 37 inches; sandy clay loam

Btk3—37 to 47 inches; sandy clay loam

2BCK—47 to 81 inches; gravelly sandy loam

### ***Minor Components Composition***

Cerrillos and similar soils: About 6 percent

Zepol and similar soils: About 4 percent

## **503—Espinosa very gravelly coarse sandy loam, 5 to 40 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,600 feet (1,707 to 2,012 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.0 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Espinosa and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Espinosa soils**

*Landscape:* Semi-bolsons

*Landform:* Low hills

*Position on landform:* Summits, shoulders, backslopes

*Parent material:* Slope alluvium derived from tuff breccia and monzonite over residuum weathered from tuff breccia

*Slope:* 5 to 40 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent subrounded gravel; about 5 percent subrounded cobbles; about 30 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, sideoats grama, New Mexico feathergrass, black grama, galleta, juniper, two-needle pinyon

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; very gravelly coarse sandy loam

Bk1—1 inch to 6 inches; very gravelly coarse sandy loam

2Bk2—6 to 12 inches; very gravelly sandy loam

2BCK—12 to 16 inches; very gravelly loamy sand

2Crk—16 to 26 inches; cemented bedrock

### ***Minor Components Composition***

Rock outcrop: About 5 percent

Puertecito and similar soils: About 3 percent

Ildefonso and similar soils: About 2 percent

## **504—Sandoval-Badland complex, 15 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,800 feet (1,646 to 2,073 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Sandoval and similar soils: 70 percent

Badland: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Sandoval soils**

*Landscape:* Semi-bolson (fig. 61)

*Landform:* Low hills (fig. 62)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 15 to 45 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent rounded cobbles; about 15 percent rounded medium and coarse gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 12 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shale Hills

*Potential native vegetation:* alkali sacaton, broom snakeweed, fourwing saltbush, black grama

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; gravelly clay loam

C1—3 to 10 inches; extremely paragravelly clay loam

C2—10 to 16 inches; extremely paragravelly clay loam

Cr—16 to 26 inches; cemented bedrock

### **Badland**

*Description:* Badland consists of exposed shale bedrock. It occurs as moderately to steeply sloping shale slopes intermingled with the Sandoval soils.

*Landscape:* Semi-bolsons (fig. 61)

*Landform:* Low hills (fig. 62)

*Parent material:* Shale

*Slope:* 40 to 160 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* 0 to 10 inches to bedrock, lithic

*Land capability subclass (nonirrigated):* 8

#### **Minor Components Composition**

Cumacho and similar soils: About 5 percent

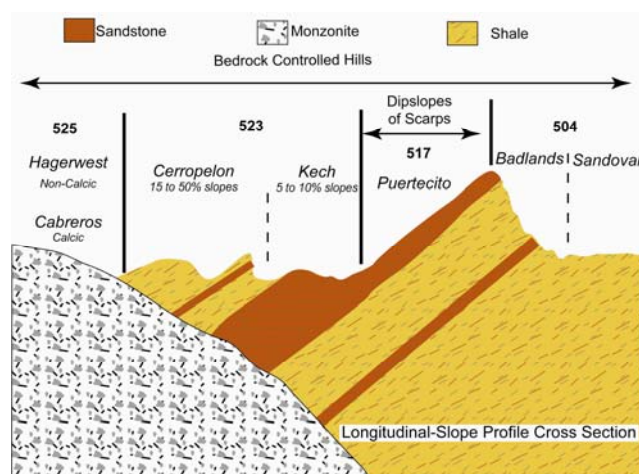
Rock outcrop: About 4 percent

Charalito and similar soils: About 1 percent



**Figure 61.—An area of Sandoval-Badland complex, 15 to 45 percent slopes. The Sandoval soils are on the left on steeper slopes, with some Badland intermixed. Badland is on some of the less sloping areas on the right.**

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**Figure 62.—Cross section diagram of landform and landform position for map units in the Galisteo Basin.**

## **505—Puertecito-Paraje complex, 15 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,100 feet (1,707 to 2,164 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Puertecito and similar soils: 50 percent

Paraje and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Puertecito soils**

*Landscape:* Fault block mountains (fig. 63 and fig. 64)

*Landform:* Low hills

*Position on landform:* Shoulders

*Parent material:* Slope alluvium derived from monzonite over residuum weathered from monzonite

*Slope:* 15 to 35 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 1 percent angular (shape or size unspecified); about 20 percent angular (shape or size unspecified); about 40 percent angular channers

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.0 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Hills

*Potential native vegetation:* oneseed juniper, blue grama, Gambel oak, black grama, galleta, snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; extremely cobbly sandy loam (fig. 65)

Bt—2 to 10 inches; very cobbly sandy clay loam

2R—10 to 20 inches; cemented bedrock

#### **Paraje soils**

*Landscape:* Fault block mountains (fig. 63 and fig. 64)

*Landform:* Low hills

*Position on landform:* Backslopes

*Parent material:* Colluvium and/or slope alluvium derived from monzonite

*Slope:* 30 to 50 percent

*Shape (down/across):* Linear/linear



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*Surface fragments:* Less than 1 percent angular rounded stones; about 35 percent angular rounded cobbles; about 20 percent angular rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 5.8 inches (low)

*Shrink-swell potential:* About 4.8 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 19 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 3 inches; very cobbly sandy loam (fig. 64)

Bt1—3 to 9 inches; very cobbly clay loam

Bt2—9 to 16 inches; very cobbly clay loam

Bt3—16 to 30 inches; very cobbly sandy clay loam

Btk—30 to 59 inches; very cobbly sandy clay loam

### **Minor Components Composition**

Rock outcrop: About 5 percent

Wandurn and similar soils: About 3 percent

Penistaja and similar soils: About 2 percent



**Figure 63.**—An area of Puertecito-Paraje complex, 15 to 50 percent slopes in the background. An area of Khapo fine sandy loam, 1 to 3 percent slopes in the foreground. The Paraje soils are on backslopes in the lower slopes of the hill. The Puertecito soils are on shoulders and summits on the upper part of the hill.



**Figure 64.—An area of Puertecito-Paraje complex, 15 to 50 percent slopes. Puertecito soils are on the right on a shoulder position. The Paraje soils are on the left on a backslope position.**



**Figure 65.—Typical profile of the Puertecito soils in an area of Puertecito-Paraje complex, 15 to 50 percent slopes. The knife is about 9 inches long.**

## **506—Ildefonso-Sandoval complex, 5 to 35 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,700 feet (1,646 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Ildefonso and similar soils: 50 percent

Sandoval and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Ildefonso soils**

*Landscape:* Fan piedmonts (fig. 66)

*Landform:* Eroded fan remnants

*Position on landform:* Shoulders, beveled summits

*Parent material:* Slope alluvium derived from monzonite

*Slope:* 5 to 25 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 35 percent subrounded gravel; about 10 percent subrounded cobbles

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.4 inches (low)

*Shrink-swell potential:* About 2.3 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; very gravelly sandy loam

Bk1—4 to 11 inches; gravelly sandy loam

Bk2—11 to 29 inches; extremely gravelly coarse sandy loam

BCK—29 to 59 inches; gravelly sandy loam

#### **Sandoval soils**

*Landscape:* Basins (fig. 66)

*Landform:* Eroded fan remnants

*Position on landform:* Backslopes

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*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from calcareous shale  
*Slope:* 15 to 35 percent  
*Shape (down/across):* Convex/convex  
*Surface fragments:* About 10 percent subrounded cobbles; about 35 percent subrounded gravel  
*Depth class:* Shallow  
*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)  
*Available water capacity:* About 2.7 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate average in horizon of maximum accumulation:* About 11 percent  
*Gypsum average in horizon of maximum accumulation:* About 1 percent  
*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Shale Hills  
*Potential native vegetation:* alkali sacaton, broom snakeweed, fourwing saltbush, black grama  
*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 2 inches; very gravelly very fine sandy loam  
C1—2 to 13 inches; gravelly sandy clay loam  
C2—13 to 19 inches; extremely paragravelly sandy clay loam  
Cr—19 to 29 inches; cemented

### **Minor Components Composition**

Truehill and similar soils: About 4 percent  
Rock outcrop: About 3 percent  
Penistaja and similar soils: About 3 percent

## **507—Ildefonso extremely gravelly sandy loam, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,000 feet (1,646 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Ildefonso and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Ildefonso soils**

*Landscape:* Semi-bolsons

*Landform:* Eroded fan remnants

*Position on landform:* Shoulders

*Parent material:* Slope alluvium derived from monzonite

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 4 percent subrounded gravel; about 10 percent subrounded cobbles

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 2.2 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; very gravelly sandy loam

Bk1—3 to 8 inches; gravelly sandy loam

Bk2—8 to 28 inches; extremely gravelly coarse sandy loam

Bk3—28 to 80 inches; gravelly sandy loam

### ***Minor Components Composition***

Truehill and similar soils: About 5 percent

Cerrillos and similar soils: About 3 percent

Penistaja and similar soils: About 2 percent

## **508—Charalito-Riverwash complex, 1 to 3 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,500 feet (1,646 to 1,981 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Charalito and similar soils: 65 percent

Riverwash: 20 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Charalito soils**

*Landscape:* Semi-bolsons (fig. 66)

*Landform:* Inset fans on valley floors

*Parent material:* Alluvium derived from monzonite, limestone, and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 2 percent angular (shape or size unspecified); about 40 percent angular channers; about 25 percent angular channers

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.4 inches (moderate)

*Shrink-swell potential:* About 2.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, sideoats grama, little bluestem, galleta, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; gravelly sandy loam

AC—1 inch to 5 inches; gravelly sandy clay loam

C1—5 to 22 inches; gravelly coarse sandy loam

C2—22 to 40 inches; gravelly sandy clay loam

C3—40 to 60 inches; paragravelly sandy loam

#### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from

prolonged high-intensity storms. In some places it is intermingled with the Charalito soil.

*Landscape:* Semi-bolsons (fig. 66)

*Landform:* Channels on valley floors

*Parent material:* Alluvium derived from mixed

*Slope:* 1 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 45 percent rounded gravel; about 5 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.3 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Seasonal high water table depth:* About 0 to 60 inches

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Land capability subclass (nonirrigated):* 8

#### **Minor Components Composition**

Chupe and similar soils: About 7 percent

Cumacho and similar soils: About 4 percent

Galisteo and similar soils: About 3 percent

Zia and similar soils: About 1 percent



**Figure 66.—An area of Charalito-Riverwash complex, 1 to 3 percent slopes, flooded, is in the foreground. An area of Ildefonso-Sandoval complex, 5 to 35 percent slopes, is in the background.**



## **509—Puertecito-Wandurn-Rock outcrop complex, 30 to 60 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,100 to 7,600 feet (1,859 to 2,316 meters)

*Mean annual precipitation:* 10 to 15 inches (254 to 381 millimeters)

*Mean annual air temperature:* 48 to 52 degrees F (8.9 to 11.1 degrees C)

*Frost-free period:* 130 to 170 days

### ***Map Unit Composition***

Puertecito and similar soils: 60 percent

Wandurn and similar soils: 20 percent

Rock outcrop: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Puertecito soils**

*Landscape:* Fault block mountains (fig. 67)

*Landform:* South-facing high hills

*Position on landform:* Shoulders, backslopes

*Parent material:* Colluvium derived from monzonite over residuum weathered from monzonite

*Slope:* 30 to 60 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 2 percent angular stones; about 10 percent angular cobbles; about 50 percent angular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Hills

*Potential native vegetation:* blue grama, Gambel oak, oneseed juniper, black grama, broom snakeweed, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 2 inches; extremely gravelly coarse sandy loam

Bt1—2 to 6 inches; very gravelly sandy clay loam

Bt2—6 to 10 inches; very gravelly clay loam

Btk—10 to 12 inches; very gravelly loam

2R—12 to 22 inches; cemented bedrock



### **Wandurn soils**

*Landscape:* Fault block mountains (fig. 67)

*Landform:* North-facing high hills

*Position on landform:* Backslopes

*Parent material:* Slope alluvium and colluvium derived from monzonite

*Slope:* 30 to 60 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 9 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic; 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.2 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, muttongrass, true mountain mahogany, sideoats grama

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 2 inches; extremely cobbly sandy clay loam

Bt1—2 to 7 inches; cobbly clay loam

Bt2—7 to 14 inches; very cobbly clay loam

Bt3—14 to 25 inches; extremely cobbly sandy clay loam

Btk—25 to 40 inches; extremely cobbly sandy clay loam

2Bt4—40 to 43 inches; sandy clay loam

2Cr—43 to 50 inches; cemented bedrock

2R—50 to 60 inches; cemented bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed monzonite bedrock. It occurs as steeply sloping bedrock, short cliffs, and knobs intermingled with the Puertecito and Wandurn soils.

*Landscape:* Fault block mountains (fig. 67)

*Landform:* High hills

*Parent material:* Monzonite

*Slope:* 40 to 160 percent

*Shape (down/across):* Linear/linear

### **Minor Components Composition**

Paraje and similar soils: About 6 percent

Penistaja and similar soils: About 3 percent

Rubble land: About 1 percent



**Figure 67.—An area of Puertecito-Wandurn-Rock outcrop complex, 30 to 60 percent slopes. The Puertecito soils are on areas with less trees. The Wandurn soils are on areas where the tree density exceeds 35 percent.**

## **510—Cerrillos-Sedillo complex, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 7,200 feet (1,707 to 2,195 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.0 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Cerrillos and similar soils: 60 percent

Sedillo and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cerrillos soils**

*Landscape:* Fan piedmonts (fig. 68)

*Landform:* Fan remnants (fig. 60)

*Position on landform:* Tread

*Parent material:* Eolian deposits derived from sandstone and shale over alluvium derived from monzonite

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.7 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 28 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; fine sandy loam

Bt—4 to 12 inches; clay loam

Btk—12 to 20 inches; clay loam

Bk1—20 to 36 inches; gravelly sandy clay loam

Bk2—36 to 46 inches; sandy clay loam

Bk3—46 to 59 inches; gravelly sandy clay loam

Bk4—59 to 86 inches; gravelly sandy clay loam

Bk5—86 to 94 inches; sandy clay loam

**Sedillo soils**

*Landscape:* Fan piedmonts (fig. 68)

*Landform:* Fan remnants (fig. 60)

*Position on landform:* Tread

*Parent material:* Eolian deposits and alluvium derived from sandstone, shale, and monzonite

*Slope:* 2 to 5 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 5.9 inches (low)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 40 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 8 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, black grama, galleta, New Mexico feathergrass, oneseed juniper, sideoats grama, twoneedle pinyon

*Land capability subclass (nonirrigated):* 6c

**Typical Profile**

A—0 to 3 inches; very fine sandy loam

BA—3 to 9 inches; loam

Btk—9 to 15 inches; very cobbly clay loam

Bk1—15 to 25 inches; extremely gravelly loam

Bk2—25 to 39 inches; very cobbly sandy loam

Bk3—39 to 52 inches; cobbly sandy clay loam

Bk4—52 to 69 inches; gravelly sandy clay loam

Bk5—69 to 80 inches; gravelly sandy loam

**Minor Components Composition**

Penistaja and similar soils: About 5 percent

Truehill and similar soils: About 3 percent

Ildefonso and similar soils: About 2 percent



**Figure 68.—An area of Cerrillos-Sedillo complex, 1 to 5 percent slopes. The Cerrillos soils are in the foreground. The Sedillo soils are in the background, where the density of trees is greater.**

## **511—Wandurn-Alchonzo-Rubble land complex, 35 to 90 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,200 to 8,900 feet (1,890 to 2,713 meters)

*Mean annual precipitation:* 14 to 18 inches (356 to 457 millimeters)

*Mean annual air temperature:* 45 to 49 degrees F (7.2 to 9.4 degrees C)

*Frost-free period:* 110 to 150 days

### ***Map Unit Composition***

Wandurn and similar soils: 50 percent

Alchonzo and similar soils: 30 percent

Rubble land: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Wandurn soils**

*Landscape:* Fault block mountains

*Landform:* South-facing mountains

*Position on landform:* Mountainflank

*Parent material:* Slope alluvium and colluvium derived from monzonite

*Slope:* 35 to 75 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.7 inches (low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* Gambel oak, twoneedle pinyon, muttongrass, oneseed juniper, sideoats grama, wolftail

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 3 inches; extremely cobbly loam

Bt1—3 to 11 inches; very cobbly sandy clay loam

Bt2—11 to 20 inches; very cobbly sandy clay loam

Bt3—20 to 30 inches; very gravelly sandy clay loam

Bt4—30 to 40 inches; extremely gravelly sandy clay loam

Bt5—40 to 47 inches; extremely gravelly sandy clay loam

R—47 to 57 inches; cemented bedrock

### **Alchonzo soils**

*Landscape:* Fault block mountains

*Landform:* North-facing mountains

*Position on landform:* Mountainflank

*Parent material:* Slope alluvium and colluvium derived from monzonite

*Slope:* 45 to 90 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular stones; about 10 percent subangular cobbles; about 60 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii

*Potential native vegetation:*

Common trees: ponderosa pine

Other plants: Gambel's oak, muttongrass, mountain muhly, sedge, eriogonum

*Land capability subclass (nonirrigated):* 8

### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 12 inches; extremely gravelly sandy loam

Bw1—12 to 27 inches; extremely gravelly sandy loam

Bw2—27 to 29 inches; very gravelly sandy loam

R—29 to 39 inches; cemented bedrock

### **Rubble land**

*Description:* Rubble land consists of talus of irregularly shaped cobbles, stones, and boulders that are devoid of vegetation. It is on very steeply sloping backslopes below basalt cliffs and is the result of parts of the cliff breaking off and tumbling downslope.

*Landscape:* Fault block mountains

*Landform:* Mountains

*Parent material:* Monzonite

*Slope:* 40 to 80 percent

*Shape (down/across):* Linear/linear

*Depth to restrictive feature:* 0 to 10 inches to bedrock, paralithic

### **Minor Components Composition**

Rock outcrop: About 6 percent

Cochiti and similar soils: About 3 percent

Pastorius and similar soils: About 1 percent

## **512—Cochiti extremely cobbly loam, 15 to 35 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,200 to 8,300 feet (1,890 to 2,530 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Cochiti and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cochiti soils**

*Landscape:* Fault block mountains

*Landform:* Mountains

*Position on landform:* Mountainbase

*Parent material:* Slope alluvium and colluvium derived from monzonite

*Slope:* 15 to 35 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 3 percent subangular boulders; about 7 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 4.7 inches (low)

*Shrink-swell potential:* About 6.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-

Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* Gambel oak, twoneedle pinyon, mountain mahogany, blue grama, oneseed juniper, sideoats grama

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 4 inches; extremely cobbly loam

Bt1—4 to 10 inches; extremely cobbly clay loam

Bt2—10 to 31 inches; very cobbly clay loam

Bt3—31 to 57 inches; extremely cobbly sandy clay loam

BC—57 to 80 inches; extremely cobbly sandy loam



***Minor Components Composition***

Rubble land: About 3 percent  
Predawn and similar soils: About 2 percent  
Wandurn and similar soils: About 2 percent  
Alchonzo and similar soils: About 2 percent  
Pastorius and similar soils: About 1 percent

## **513—Pedregal very cobbly loam, 8 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,300 to 7,800 feet (1,920 to 2,377 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Pedregal and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Pedregal soils**

*Landscape:* Fan piedmonts

*Landform:* Fan remnants

*Position on landform:* Tread

*Parent material:* Alluvium derived from monzonite

*Slope:* 8 to 15 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent subrounded stones; about 15 percent subrounded cobbles; about 25 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 20 to 36 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 3.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 60 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* oneseed juniper, true mountain mahogany, twoneedle pinyon, pricklypear, skunkbush sumac

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material (fig. 69)

A—1 inch to 3 inches; very cobbly loam

Bt1—3 to 7 inches; very cobbly clay loam

Bt2—7 to 12 inches; very cobbly clay loam

Btk—12 to 18 inches; very cobbly clay loam

Bk1—18 to 25 inches; very gravelly sandy loam

Bkkm—25 to 33 inches; very gravelly sandy loam

2Bk2—33 to 42 inches; very gravelly loamy coarse sand

2Bk3—42 to 79 inches; extremely gravelly coarse sand

***Minor Components Composition***

Cochiti and similar soils: About 6 percent

Predawn and similar soils: About 3 percent

Pastorius and similar soils: About 1 percent



**Figure 69.—**Typical profile of Pedregal very cobbly loam, 8 to 15 percent slopes, with the dark surface, red subsoil, and white substratum. A well developed petrocalcic horizon, cemented by calcium carbonate, exists in this soil in the upper part of the white area. There are many rock fragments throughout this soil.

## **514—Pegasus extremely cobbly loam, 20 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 7,700 feet (1,737 to 2,347 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Pegasus and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Pegasus soils**

*Landscape:* Fault block mountains

*Landform:* Low hills

*Position on landform:* Summits, backslopes, shoulders

*Parent material:* Slope alluvium and colluvium derived from monzonite

*Slope:* 20 to 50 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 2 percent angular stones; about 35 percent angular cobbles; about 35 percent angular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis

*Potential native vegetation:* twoneedle pinyon, oneseed juniper, true mountain mahogany, blue grama, sideoats grama

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

A—0 to 4 inches; extremely cobbly loam

Bt1—4 to 10 inches; cobbly loam

Bt2—10 to 14 inches; very gravelly clay loam

2R—14 to 24 inches; cemented bedrock

### ***Minor Components Composition***

Rock outcrop: About 4 percent

Wandurn and similar soils: About 4 percent

Alchonzo and similar soils: About 2 percent

## **515—Pastorius very cobbly loam, 3 to 5 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 8,100 feet (1,829 to 2,469 meters)

*Mean annual precipitation:* 14 to 18 inches (356 to 457 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 110 to 130 days

### ***Map Unit Composition***

Pastorius and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Pastorius soils**

*Landscape:* Fault block mountains

*Landform:* Low stream terraces on valley floors

*Position on landform:* Tread

*Parent material:* Alluvium derived from monzonite

*Slope:* 3 to 5 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 25 percent subrounded gravel; about 20 percent subrounded cobbles

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.9 inches (low)

*Shrink-swell potential:* About 3.9 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus ponderosa/Festuca arizonica-Danthonia parryi

*Potential native vegetation:* ponderosa pine, Gambel oak, mountain muhly, muttongrass, blue grama

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 6 inches; very cobbly loam

Bt1—6 to 17 inches; very cobbly loam

Bt2—17 to 28 inches; extremely cobbly loam

Bt3—28 to 43 inches; extremely cobbly loam

Bt4—43 to 82 inches; extremely cobbly loam

### ***Minor Components Composition***

Pedregal and similar soils: About 5 percent

Cochiti and similar soils: About 3 percent

Riverwash: About 2 percent

## **516—Cerrillos fine sandy loam, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,900 feet (1,646 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Cerrillos and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cerrillos soils**

*Landscape:* Semi-bolsos (fig. 70)

*Landform:* Alluvial flats

*Parent material:* Eolian deposits derived from sandstone and shale over alluvium derived from monzonite

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 7.8 inches (moderate)

*Shrink-swell potential:* About 2.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 26 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 4 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 8 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; fine sandy loam

Bt—4 to 14 inches; sandy clay loam

Btk—14 to 20 inches; sandy clay loam

Bk1—20 to 28 inches; loam

Bk2—28 to 43 inches; gravelly sandy loam

Bk3—43 to 53 inches; gravelly sandy loam

Bk4—53 to 65 inches; fine sandy loam

Bk5—65 to 72 inches; gravelly fine sandy loam

Bk6—72 to 110 inches; very fine sandy loam

### ***Minor Components Composition***

Penistaja and similar soils: About 5 percent

Sedillo and similar soils: About 3 percent

Cumacho and similar soils: About 2 percent



**Figure 70.—An area of Cerrillos fine sandy loam, 1 to 4 percent slopes. In the background is an area of Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes. The top of the Ortiz Mountains is on the horizon.**

## **517—Puertecito extremely gravelly fine sandy loam, 15 to 25 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,100 feet (1,646 to 2,164 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Puertecito and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Puertecito soils**

*Landscape:* Semi-bolsons

*Landform:* Dipslopes on cuestras (fig. 62)

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 15 to 25 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 55 percent subangular gravel; about 15 percent subangular cobbles

*Depth class:* Shallow

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 0.8 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 9 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Hills

*Potential native vegetation:* blue grama, oneseed juniper, Gambel oak, black grama, broom snakeweed, galleta, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 2 inches; extremely gravelly fine sandy loam

Bt—2 to 6 inches; gravelly loam

Btk—6 to 11 inches; very gravelly loam

R—11 to 21 inches; cemented bedrock

### ***Minor Components Composition***

Rock outcrop: About 6 percent

Sandoval and similar soils: About 4 percent



## **518—Rock outcrop-Skyvillage complex, 5 to 35 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,100 feet (1,646 to 2,164 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Rock outcrop: 50 percent

Skyvillage and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Rock outcrop**

*Description:* Rock outcrop consists of exposed sandstone bedrock. It occurs as gently to moderately sloping bedrock, knobs, ledges, and cliffs intermingled with the Skyvillage soil.

*Landscape:* Semi-bolsos (fig. 71)

*Landform:* Ridges, structural benches

*Parent material:* Sandstone

*Slope:* 15 to 150 percent

*Shape (down/across):* Convex/convex

*Depth to restrictive feature:* At the surface bedrock, lithic

#### **Skyvillage soils**

*Landscape:* Semi-bolsos (fig. 71)

*Landform:* Ridges, structural benches

*Position on landform:* Summits, shoulders, backslopes

*Parent material:* Residuum weathered from sandstone

*Slope:* 5 to 35 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 15 percent subrounded gravel

*Depth class:* Very shallow

*Depth to restrictive feature:* 2 to 10 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.4 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 10 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Shallow Sandstone

*Potential native vegetation:* sideoats grama, blue grama, New Mexico feathergrass, black grama, true mountain mahogany, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

***Typical Profile***

A—0 to 3 inches; gravelly loamy sand

C—3 to 6 inches; gravelly sandy loam

R—6 to 16 inches; cemented bedrock

***Minor Components Composition***

Sandoval and similar soils: About 4 percent

Cerropelon and similar soils: About 3 percent

Cumacho and similar soils: About 3 percent



**Figure 71.—An area of Rock outcrop-Skyvillage complex, 5 to 35 percent slopes. Rock outcrop dominates this area. Skyvillage soils are on the areas of vegetation.**

## **519—Cumacho fine sandy loam, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,800 feet (1,646 to 2,073 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Cumacho and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cumacho soils**

*Landscape:* Semi-bolsons (fig. 73)

*Landform:* Pediments (fig. 72)

*Position on landform:* Foothslopes, backslopes

*Parent material:* Eolian deposits and alluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 2 to 8 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, densic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.2 inches (moderate)

*Shrink-swell potential:* About 3.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* About 2 percent

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, ring muhly, galleta, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; fine sandy loam (fig. 74)

Bt—1 inch to 7 inches; loam

Btk—7 to 11 inches; clay loam

2Bk—11 to 19 inches; clay loam

2BCky—19 to 33 inches; paragravelly clay loam

2C—33 to 46 inches; extremely paragravelly fine sandy loam

2Cd—46 to 64 inches; cemented bedrock

### ***Minor Components Composition***

Penistaja and similar soils: About 5 percent

Cerrillos and similar soils: About 3 percent

Ildefonso and similar soils: About 2 percent

## Soil Survey of Santa Fe County Area, New Mexico

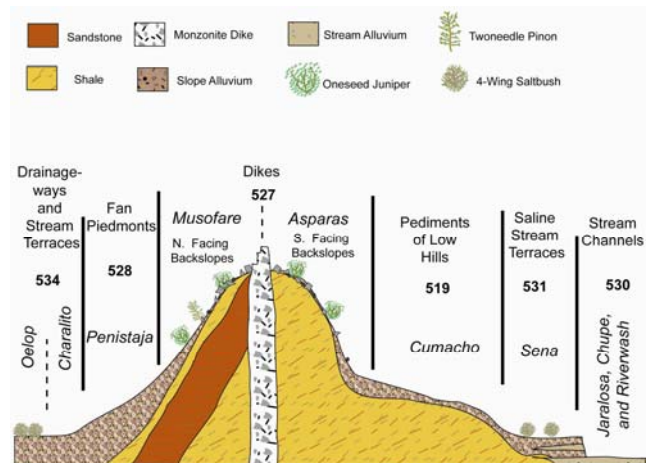


Figure 72.—Cross-section diagram of landform and landform position for map units in the Galisteo Basin, close to Galisteo.



Figure 73.—An area of Cumacho fine sandy loam, 2 to 8 percent slopes, showing a hand-dug soil pit. Many tools of the trade are surrounding the pit.



**Figure 74.—Typical profile of Cumacho fine sandy loam, 2 to 8 percent slopes.**

## **520—Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,900 feet (1,646 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Cielito and similar soils: 35 percent

Netoma and similar soils: 30 percent

Tanbark and similar soils: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Cielito soils**

*Landscape:* Semi-bolsos (fig. 70, fig. 75, and fig. 76)

*Landform:* Low hills

*Position on landform:* Footslopes, shoulders

*Parent material:* Eolian material and slope alluvium derived from sandstone and gypsum over residuum weathered from gypsum

*Slope:* 1 to 10 percent

*Shape (down/across):* Convex/concave

*Surface fragments:* About 1 percent subrounded medium and coarse gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 6.4 inches (moderate)

*Shrink-swell potential:* About 3.2 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 12 percent

*Gypsum average in horizon of maximum accumulation:* About 90 percent

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 11 (slightly sodic)

*Ecological site:* Limy

*Potential native vegetation:* sand dropseed, New Mexico feathergrass, black grama, ephedra, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; very fine sandy loam (fig. 77)

Bt—1 inch to 6 inches; gypsiferous clay loam

2By1—6 to 20 inches; gypsiferous loam

2By2—20 to 28 inches; gypsiferous loam

2By/C—28 to 47 inches; stratified gypsiferous coarse sand to gypsiferous coarse sandy loam

2R—47 to 57 inches; cemented bedrock

### **Netoma soils**

*Landscape:* Semi-bolsons (fig. 70, fig. 75, and fig. 76)

*Landform:* Low hills

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from gypsum and sandstone

*Slope:* 4 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.2 inches (moderate)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 11 percent

*Gypsum average in horizon of maximum accumulation:* About 80 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 10  
(slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sand dropseed, black grama, Bigelow's  
rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6s

### **Typical Profile**

A—0 to 1 inch; fine sandy loam (fig. 77)

By1—1 inch to 10 inches; gypsiferous very fine sandy loam

By2—10 to 17 inches; gypsiferous loam

By3—17 to 32 inches; gypsiferous loam

By4—32 to 46 inches; gypsiferous fine sandy loam

By5—46 to 72 inches; gypsiferous fine sandy loam

C—72 to 106 inches; gypsiferous sandy loam

### **Tanbark soils**

*Landscape:* Semi-bolsons (fig. 70, fig. 75, and fig. 76)

*Landform:* Low hills

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from gypsum

*Slope:* 15 to 25 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 5 percent rounded medium and coarse gravel

*Depth class:* Very shallow

*Depth to restrictive feature:* 4 to 10 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 48 percent

*Gypsum average in horizon of maximum accumulation:* About 90 percent

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very  
slightly saline)

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*Sodium adsorption ratio average in horizon of maximum accumulation:* About 12 (slightly sodic)

*Ecological site:* Gyp Hills

*Potential native vegetation:* ephedra, galleta, gyp dropseed, black grama, sideoats grama

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 3 inches; gypsiferous coarse sandy loam (fig. 77)

By—3 to 7 inches; gypsiferous coarse sandy loam

Cr—7 to 17 inches; cemented bedrock

### **Minor Components Composition**

Badland: About 7 percent

Rock outcrop: About 3 percent



**Figure 75.—An area of Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes, showing a landscape of the Cielito soil. The white areas are where gypsum is close to the soil surface.**





**Figure 76.—An area of Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes. The foreground shows an area of Netoma soil. An inclusion of Badland is intermixed with the Tanbark soil in the background.**



**Figure 77.—A profile of the Tanbark soil in an area of Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes. This very shallow soil has strong accumulations of gypsum over gypsum bedrock, with very well developed cryptogams (microbiotic crusts) on the surface.**

## **521—Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,400 feet (1,646 to 2,256 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Devargas and similar soils: 50 percent

Riovista and similar soils: 30 percent

Riverwash: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Devargas soils**

*Landscape:* Fan piedmonts (fig. 78 and fig. 79)

*Landform:* Stream terraces (fig. 60)

*Position on landform:* Tread

*Parent material:* Alluvium derived from monzonite and sandstone

*Slope:* 1 to 5 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 20 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.9 inches (low)

*Shrink-swell potential:* About 2.3 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, black grama, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; sandy loam

Bt—2 to 6 inches; loam

Btk1—6 to 18 inches; loam

Btk2—18 to 30 inches; sandy loam

2BCK—30 to 60 inches; extremely cobbly coarse sand

### **Riovista soils**

*Landscape:* Fan piedmonts (fig. 78 and fig. 79)

*Landform:* Flood plain steps on valley floors (fig. 60)

*Position on landform:* Tread

*Parent material:* Alluvium derived from monzonite

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent rounded stones; about 10 percent rounded cobbles; about 15 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Excessively drained

*Slowest permeability:* 6.0 to 20 in/hr (rapid)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Rare

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, galleta, juniper, sideoats grama, twoneedle pinyon

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A1—0 to 5 inches; cobbly sandy loam

A2—5 to 14 inches; extremely cobbly sandy loam

C1—14 to 30 inches; extremely cobbly coarse sand

C2—30 to 60 inches; stratified coarse sand to extremely cobbly loamy sand

### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Riovista soil.

*Landscape:* Fan piedmonts (fig. 78 and fig. 79)

*Landform:* Channels on valley floors (fig. 60)

*Parent material:* Alluvium derived from mixed

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded cobbles; about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

## Soil Survey of Santa Fe County Area, New Mexico

*Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)*

*Land capability subclass (nonirrigated): 8*

### **Minor Components Composition**

Penistaja and similar soils: About 6 percent

Ildfonso and similar soils: About 4 percent



Figure 78.—An area of Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded. This is a typical area of the Devargas soil.



Figure 79.—An area of Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded. This is a typical area of Riovista soil. Notice the amount of surface rock fragments and sparseness of vegetation as opposed to the Devargas soil in the previous picture.

## **522—Penistaja family fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,500 to 6,900 feet (1,676 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Penistaja family and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Penistaja family soils**

*Landscape:* Semi-bolsons

*Landform:* Alluvial flats

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 5 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.7 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

Btk1—2 to 13 inches; loam

Btk2—13 to 25 inches; clay loam

Btk3—25 to 47 inches; clay loam

Btk4—47 to 91 inches; clay loam

Btk5—91 to 98 inches; sandy clay loam

### ***Minor Components Composition***

Cerrillos and similar soils: About 5 percent

Ildefonso and similar soils: About 4 percent

Truehill and similar soils: About 1 percent

## **523—Kech-Cerropelon-Rock outcrop complex, 5 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,100 feet (1,646 to 2,164 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Kech and similar soils: 45 percent

Cerropelon and similar soils: 35 percent

Rock outcrop: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Kech soils**

*Landscape:* Semi-bolsos

*Landform:* Bedrock controlled structural benches on hills (fig. 62)

*Position on landform:* Shoulders, summits

*Parent material:* Slope alluvium derived from sandstone over residuum weathered from sandstone

*Slope:* 5 to 10 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.8 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Shallow Sandstone

*Potential native vegetation:* sideoats grama, Gambel oak, black grama, oneseed juniper, skunkbush sumac

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 2 inches; loamy fine sand

A2—2 to 4 inches; fine sandy loam

Bt1—4 to 8 inches; gravelly sandy clay loam

Bt2—8 to 12 inches; sandy clay loam

Bt3—12 to 18 inches; sandy clay loam

R—18 to 28 inches; cemented bedrock

### **Cerropelon soils**

*Landscape:* Semi-bolsos

*Landform:* Bedrock controlled hills (fig. 62)

*Position on landform:* Shoulders, backslopes

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 15 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent subrounded stones; about 15 percent subrounded cobbles; about 20 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.6 inches (low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandstone Hills

*Potential native vegetation:* blue grama, Gambel oak, mountain mahogany, oneseed juniper, sideoats grama

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 1 inch; very cobbly sandy loam

Bt1—1 inch to 6 inches; gravelly clay loam

Bt2—6 to 12 inches; clay loam

Btk—12 to 21 inches; clay loam

BCK—21 to 28 inches; clay loam

Cr—28 to 39 inches; cemented bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed sandstone bedrock. It occurs as moderately sloping bedrock, ledges, and cliffs intermingled with the Bond and Cerropelon soils.

*Landscape:* Semi-bolsos

*Landform:* Bedrock controlled hills (fig. 62)

*Parent material:* Sandstone

*Slope:* 25 to 70 percent

*Shape (down/across):* Convex/convex

### **Minor Components Composition**

Skyvillage and similar soils: About 5 percent

Cumacho and similar soils: About 3 percent

Badland: About 2 percent



## **524—Zia-Gullied land complex, 2 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,100 feet (1,646 to 2,164 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Zia and similar soils: 65 percent

Gullied land: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Zia soils**

*Landscape:* Semi-bolsons

*Landform:* Low stream terraces

*Position on landform:* Backslopes, shoulders

*Position on landform:* Tread

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 2 to 10 percent

*Shape (down/across):* Linear/convex

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 7.6 inches (moderate)

*Shrink-swell potential:* About 2.5 percent (low)

*Flooding hazard:* Very rare

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, black grama, galleta, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 3 inches; fine sandy loam

A2—3 to 13 inches; fine sandy loam

C1—13 to 27 inches; fine sandy loam

2C2—27 to 41 inches; loamy fine sand

2C3—41 to 79 inches; fine sandy loam

#### **Gullied land**

*Landscape:* Semi-bolsons

*Landform:* Low stream terraces



## Soil Survey of Santa Fe County Area, New Mexico

*Position on landform:* Riser

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 50 to 200 percent

*Shape (down/across):* Convex/convex

### ***Minor Components Composition***

Charalito and similar soils: About 4 percent

Sena and similar soils: About 3 percent

Galisteo and similar soils: About 3 percent

## **525—Hagerman-Cabreros complex, 2 to 6 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,000 to 7,000 feet (1,829 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Hagerman and similar soils: 50 percent

Cabreros and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Hagerman soils**

*Landscape:* Fault block mountains

*Landform:* Structural benches on sills (fig. 62)

*Position on landform:* Footslopes

*Parent material:* Eolian deposits and slope alluvium derived from sandstone, shale, and andesite over residuum weathered from andesite

*Slope:* 2 to 6 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; sandy loam

Bt1—3 to 7 inches; clay loam

Bt2—7 to 22 inches; clay loam

Btk—22 to 30 inches; sandy clay loam

Cr—30 to 35 inches; cemented bedrock

R—35 to 45 inches; cemented bedrock

**Cabreros soils**

*Landscape:* Fault block mountains

*Landform:* Structural benches on sills (fig. 62)

*Position on landform:* Toeslopes

*Parent material:* Eolian material and alluvium derived from sandstone over residuum derived from monzonite, eolian deposits and slope alluvium derived from sandstone, shale, and andesite over residuum weathered from andesite

*Slope:* 2 to 6 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 59 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 5.0 inches (low)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 32 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Hills

*Potential native vegetation:* blue grama, oak, oneseed juniper, black grama, galleta

*Land capability subclass (nonirrigated):* 6c

**Typical Profile**

A—0 to 2 inches; fine sandy loam

Bt1—2 to 9 inches; loam

Bt2—9 to 18 inches; clay loam

Btk—18 to 25 inches; loam

BCK—25 to 34 inches; gravelly sandy loam

Cr—34 to 47 inches; cemented bedrock

R—47 to 57 inches; cemented bedrock

**Minor Components Composition**

Penistaja and similar soils: About 4 percent

Rock outcrop: About 4 percent

Ildefonso and similar soils: About 2 percent

## **526—Penistaja family-Truehill complex, 3 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,800 to 6,900 feet (1,768 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Penistaja family and similar soils: 50 percent

Truehill and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Penistaja family soils**

*Landscape:* Semi-bolsos

*Landform:* Fan aprons

*Position on landform:* Footslopes

*Parent material:* Slope alluvium derived from sandstone, shale, and monzonite

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 11.0 inches (high)

*Shrink-swell potential:* About 4.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

A—0 to 3 inches; sandy loam (fig. 80)

Bt—3 to 9 inches; loam

Btk1—9 to 27 inches; loam

Btk2—27 to 53 inches; loam

Bk1—53 to 83 inches; gravelly loam

Bk2—83 to 102 inches; sandy loam

#### **Truehill soils**

*Landscape:* Basins

*Landform:* Inset fans on fan aprons

*Position on landform:* Summits

## Soil Survey of Santa Fe County Area, New Mexico

*Parent material:* Slope alluvium derived from sandstone, shale, and monzonite  
*Slope:* 5 to 15 percent  
*Shape (down/across):* Linear/convex  
*Surface fragments:* About 2 percent well rounded stones; about 15 percent well rounded cobbles; about 41 percent well rounded gravel  
*Depth class:* Very deep  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 2.8 inches (very low)  
*Shrink-swell potential:* About 3.6 percent (moderate)  
*Runoff class:* Medium  
*Calcium carbonate average in horizon of maximum accumulation:* About 40 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Gravelly  
*Potential native vegetation:* blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon  
*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 4 inches; extremely gravelly loam (fig. 80)  
Bt—4 to 7 inches; very gravelly clay loam  
Btk—7 to 12 inches; very gravelly clay loam  
Bk1—12 to 22 inches; extremely cobbly sandy loam  
Bk2—22 to 40 inches; extremely gravelly coarse sandy loam  
Bk3—40 to 49 inches; extremely gravelly coarse sand  
Bk4—49 to 67 inches; extremely gravelly sandy clay loam  
2BCK—67 to 80 inches; extremely gravelly loamy coarse sand

### **Minor Components Composition**

Cerrillos and similar soils: About 4 percent  
Cumacho and similar soils: About 3 percent  
Ildefonso and similar soils: About 2 percent  
Charalito and similar soils: About 1 percent



**Figure 80.—Typical profile of the Truehill soil in an area of Penistaja family-Truehill complex, 3 to 15 percent slopes, with a dark surface, a red subsoil, and a white substratum. There are many rock fragments throughout this soil.**

## **527—Musofare-Asparas complex, 20 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,600 to 6,900 feet (1,707 to 2,103 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Musofare and similar soils: 50 percent

Asparas and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Musofare soils**

*Landscape:* Basins

*Landform:* South-facing dikes (fig. 72)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from diorite, andesite, sandstone, and shale

*Slope:* 20 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent angular stones; about 30 percent angular cobbles; about 35 percent angular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 2 to 4 inches to abrupt textural change; 20 to 59 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.1 inches (low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 18 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shallow Sandstone

*Potential native vegetation:* sideoats grama, blue grama, little bluestem, mountain mahogany, black grama, oneseed juniper

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 2 inches; extremely cobbly sandy loam

Bt—2 to 13 inches; very gravelly clay loam

Btk1—13 to 22 inches; very cobbly loam

Btk2—22 to 34 inches; very cobbly loam

2Cr—34 to 50 inches; cemented bedrock

2R—50 to 60 inches; cemented bedrock

**Asparas soils**

*Landscape:* Basins

*Landform:* North-facing dikes (fig. 72)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from diorite, andesite, sandstone, and shale

*Slope:* 20 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 30 percent angular gravel; about 30 percent angular cobbles; about 2 percent angular stones; about 1 percent angular boulders

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 5.7 inches (low)

*Shrink-swell potential:* About 7.9 percent (high)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Cinder

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper

*Land capability subclass (nonirrigated):* 7s

**Typical Profile**

A—0 to 2 inches; extremely cobbly loam

Bt1—2 to 7 inches; sandy clay loam

Bt2—7 to 11 inches; clay

Btk—11 to 30 inches; very cobbly clay loam

CBtk—30 to 43 inches; clay

Cr—43 to 53 inches; cemented bedrock

**Minor Components Composition**

Sandoval and similar soils: About 5 percent

Skyvillage and similar soils: About 3 percent

Rock outcrop: About 2 percent



## **528—Penistaja family loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 7,000 feet (1,646 to 2,134 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Penistaja family and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Penistaja family soils**

*Landscape:* Basins

*Landform:* Fan aprons (fig. 72)

*Position on landform:* Toeslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 3 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, black grama, ring muhly, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 1 inch; loam

A2—1 inch to 5 inches; loam

Btk1—5 to 14 inches; clay loam

Btk2—14 to 24 inches; clay loam

Btk3—24 to 41 inches; clay loam

BCtk—41 to 83 inches; loam

### ***Minor Components Composition***

Truehill and similar soils: About 4 percent

Cumacho and similar soils: About 3 percent

Cerrillos and similar soils: About 3 percent

## **530—Jaralosa-Chupe-Riverwash complex, 0 to 1 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,300 to 7,200 feet (1,615 to 2,195 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Jaralosa and similar soils: 45 percent

Chupe and similar soils: 30 percent

Riverwash: 10 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Jaralosa soils**

*Landscape:* Basins

*Landform:* Point bars on valley floors (fig. 72)

*Parent material:* Alluvium derived from sandstone and shale over alluvium derived from granite, gneiss, schist, or monzonite

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Depth to restrictive feature:* 30 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Moderately well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.8 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* *Populus fremontii*/Salix exigua-Salix/Carex

*Potential native vegetation:* cottonwood, willow, sedge

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; very fine sandy loam

AC—1 inch to 17 inches; very fine sandy loam

Cnyz1—17 to 24 inches; loamy very fine sand

Cnyz2—24 to 41 inches; loamy very fine sand

2C1—41 to 60 inches; gravelly coarse sand

2C2—60 to 85 inches; very gravelly coarse sand

### **Chupe soils**

*Landscape:* Basins

*Landform:* Flood plains on valley floors (fig. 72)

*Parent material:* Alluvium derived from sandstone, granite, gneiss, and schist

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent rounded medium and coarse gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 33 to 43 inches to strongly contrasting textural stratification

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 3.3 inches (low)

*Shrink-swell potential:* About 0.6 percent (low)

*Flooding hazard:* Occasional

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* sand dropseed, black grama, blue grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

AC—0 to 3 inches; loamy coarse sand

C1—3 to 10 inches; gravelly coarse sand

C2—10 to 26 inches; gravelly coarse sand

C3—26 to 31 inches; gravelly coarse sand

C4—31 to 37 inches; gravelly coarse sand

C5—37 to 42 inches; very gravelly coarse sand

C6—42 to 50 inches; sandy clay loam

C7—50 to 65 inches; gravelly loamy coarse sand

C8—65 to 84 inches; coarse sand

C9—84 to 96 inches; gravelly coarse sand

### **Riverwash**

*Description:* Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe soil.

*Landscape:* Basins

*Landform:* Channels on valley floors (fig. 72)

*Parent material:* Alluvium derived from mixed sources

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent rounded (shape or size unspecified); about 20 percent rounded gravel

*Drainage class:* Excessively drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

## Soil Survey of Santa Fe County Area, New Mexico

*Available water capacity:* About 2.9 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Flooding hazard:* Frequent

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Sena and similar soils: About 5 percent

Galisteo and similar soils: About 5 percent

Mirada and similar soils: About 5 percent

## **531—Sena very fine sandy loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,400 to 6,600 feet (1,646 to 2,012 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Sena and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Sena soils**

*Landscape:* Basins (fig. 81)

*Landform:* Flood plain steps on valley floors (fig. 72)

*Position on landform:* Tread

*Parent material:* Alluvium derived from shale

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Depth to restrictive feature:* 2 inches to natric

*Drainage class:* Well drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 6.0 inches (low)

*Shrink-swell potential:* About 7.9 percent (high)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* About 2 percent

*Salinity average in horizon of maximum accumulation:* About 18 mmhos/cm (strongly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 20 (moderately sodic)

*Ecological site:* Salt Flats

*Potential native vegetation:* alkali sacaton, blue grama, fourwing saltbush, galleta

*Land capability subclass (nonirrigated):* 6s

### ***Typical Profile***

Akz1—0 to 1 inch; very fine sandy loam

Akz2—1 inch to 4 inches; loam

Btknyz1—4 to 11 inches; clay loam

Btknyz2—11 to 20 inches; clay

Btknyz3—20 to 30 inches; clay

Cz1—30 to 58 inches; clay

Cz2—58 to 83 inches; clay

### ***Minor Components Composition***

Riverwash: About 3 percent

Galisteo and similar soils: About 3 percent

Charalito and similar soils: About 2 percent

Zia and similar soils: About 2 percent



**Figure 81.—An area of Sena very fine sandy loam, 0 to 2 percent slopes.  
The Cerro Pílan is in the upper left background.**

## **532—Galisteo silty clay loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,700 to 6,700 feet (1,737 to 2,042 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Galisteo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Galisteo soils**

*Landscape:* Basins

*Landform:* Stream terraces

*Position on landform:* Tread

*Parent material:* Alluvium derived from shale

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.4 inches (high)

*Shrink-swell potential:* About 7.0 percent (high)

*Flooding hazard:* Very rare

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Salt Flats

*Potential native vegetation:* alkali sacaton, blue grama, fourwing saltbush, galleta

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; silty clay loam

AB—4 to 16 inches; clay

Bz1—16 to 45 inches; clay

Bz2—45 to 67 inches; clay loam

C—67 to 80 inches; gravelly sandy clay loam

### ***Minor Components Composition***

Gullied land: About 5 percent

Sena and similar soils: About 2 percent

Riverwash: About 2 percent

Penistaja and similar soils: About 1 percent

## **534—Oelop-Charalito complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 5,300 to 7,300 feet (1,615 to 2,225 meters)

*Mean annual precipitation:* 10 to 13 inches (254 to 330 millimeters)

*Mean annual air temperature:* 50 to 52 degrees F (10.0 to 11.1 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Oelop and similar soils: 70 percent

Charalito and similar soils: 20 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Oelop soils**

*Landscape:* Basins

*Landform:* Stream terraces (fig. 72)

*Position on landform:* Tread

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 55 to 63 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.9 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; sandy clay loam

Btk1—2 to 10 inches; clay loam

Btk2—10 to 27 inches; loam

Btk3—27 to 35 inches; clay loam

Btk4—35 to 60 inches; sandy clay loam

2BCK—60 to 79 inches; gravelly coarse sand

#### **Charalito soils**

*Landscape:* Basins

*Landform:* Flood plain steps on valley floors (fig. 72)



## Soil Survey of Santa Fe County Area, New Mexico

*Position on landform:* Tread  
*Parent material:* Alluvium derived from sandstone and shale  
*Slope:* 1 to 3 percent  
*Shape (down/across):* Linear/linear  
*Surface fragments:* About 5 percent subrounded gravel  
*Depth class:* Very deep  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 3.7 inches (low)  
*Shrink-swell potential:* About 0.5 percent (low)  
*Flooding hazard:* Rare  
*Runoff class:* Very low  
*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)  
*Ecological site:* Gravelly  
*Potential native vegetation:* New Mexico feathergrass, blue grama, sideoats grama,  
little bluestem, galleta, oneseed juniper  
*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 6 inches; loamy sand  
C1—6 to 21 inches; loamy sand  
2C2—21 to 34 inches; sandy loam  
3C3—34 to 79 inches; very gravelly coarse sand

### **Minor Components Composition**

Sedillo and similar soils: About 4 percent  
Hagerman and similar soils: About 3 percent  
Riverwash: About 3 percent

## **550—Pits, mine**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,500 to 8,000 feet (1,981 to 2,438 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 48 to 50 degrees F (8.9 to 10.0 degrees C)

*Frost-free period:* 140 to 170 days

### ***Map Unit Composition***

Pits, mine: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Pits, mine**

*Parent material:* Mine spoil or earthy fill derived from monzonite

*Slope:* 8 to 40 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 5 percent subrounded cobbles; about 35 percent subrounded gravel

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 4.5 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Land capability subclass (nonirrigated):* 8

### ***Minor Components Composition***

Pegasus and similar soils: About 5 percent

Pedregal and similar soils: About 4 percent

Cochiti and similar soils: About 2 percent

Wandurn and similar soils: About 2 percent

Alchonzo and similar soils: About 2 percent

## **600—Hyer-Witt complex, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 11 to 14 inches (279 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Hyer and similar soils: 50 percent

Witt and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Hyer soils**

*Landscape:* Intermontane basins

*Landform:* Lower areas on fan piedmonts (fig. 83)

*Position on landform:* Summits

*Parent material:* Eolian deposits and/or alluvium derived from sandstone and shale

*Slope:* 1 to 2 percent

*Shape (down/across):* Concave/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.1 inches (high)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; silt loam

Bt1—2 to 6 inches; silty clay loam

Bt2—6 to 9 inches; silty clay loam

Bt3—9 to 15 inches; silty clay loam

Btk1—15 to 24 inches; silty clay loam

Btk2—24 to 45 inches; loam

Bk1—45 to 61 inches; very fine sandy loam

Bk2—61 to 79 inches; loam

C—79 to 100 inches; loam

**Witt soils**

*Landscape:* Intermontane basins

*Landform:* Higher areas on fan piedmonts (fig. 83)

*Position on landform:* Summits

*Parent material:* Eolian deposits and/or alluvium derived from sandstone and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.7 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 18 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand  
dropseed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

**Typical Profile**

A—0 to 2 inches; loam

Bt1—2 to 10 inches; clay loam

Btk1—10 to 17 inches; clay loam

Btk2—17 to 33 inches; clay loam

Bk1—33 to 48 inches; loam

Bk2—48 to 88 inches; clay loam

Bk3—88 to 122 inches; clay loam

**Minor Components Composition**

Harvey and similar soils: About 4 percent

Ildefonso and similar soils: About 3 percent

Palma and similar soils: About 3 percent

## **601—Harvey loam, 3 to 12 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Harvey and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Harvey soils**

*Landscape:* Intermontane basins

*Landform:* South-facing fan piedmonts (fig. 83)

*Position on landform:* Backslopes

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 3 to 12 percent

*Shape (down/across):* Convex/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 11.0 inches (high)

*Shrink-swell potential:* About 3.9 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 47 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Limy

*Potential native vegetation:* blue grama, galleta, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bk1—2 to 14 inches; fine sandy loam

Bk2—14 to 36 inches; clay loam

Bk3—36 to 53 inches; clay loam

Bk4—53 to 79 inches; clay loam

BC—79 to 121 inches; loam

### ***Minor Components Composition***

Palma and similar soils: About 5 percent

Witt and similar soils: About 2 percent

Lazarus and similar soils: About 2 percent

Hyer and similar soils: About 1 percent

## **602—Palma fine sandy loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Palma and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Palma soils**

*Landscape:* Intermontane basins

*Landform:* North-facing fan piedmonts (fig. 83)

*Position on landform:* Backslopes

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.4 inches (moderate)

*Shrink-swell potential:* About 2.9 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sideoats grama, galleta

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

AE—2 to 5 inches; fine sandy loam

Bt—5 to 11 inches; loam

Btk1—11 to 17 inches; loam

Btk2—17 to 30 inches; fine sandy loam

Btk3—30 to 43 inches; fine sandy loam

Bk—43 to 74 inches; silt loam

BC—74 to 125 inches; sandy clay loam

### ***Minor Components Composition***

Hyer and similar soils: About 4 percent

Harvey and similar soils: About 3 percent

Lazarus and similar soils: About 2 percent

Witt and similar soils: About 1 percent

## **603—Lazarus silt loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Lazarus and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Lazarus soils**

*Landscape:* Intermontane basins

*Landform:* Flood plains on valley floors (fig. 83 and fig. 85)

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 11.3 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Flooding hazard:* Occasional

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A1—0 to 3 inches; silt loam

A2—3 to 14 inches; silt loam

Bt1—14 to 32 inches; silt loam

Bt2—32 to 53 inches; silty clay loam

Bt3—53 to 102 inches; silty clay loam

### ***Minor Components Composition***

Manzano and similar soils: About 5 percent

Harvey and similar soils: About 3 percent

Palma and similar soils: About 2 percent

## **604—Desario-Espadon complex, 5 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 8,000 feet (1,951 to 2,438 meters)

*Mean annual precipitation:* 13 to 15 inches (330 to 381 millimeters)

*Mean annual air temperature:* 48 to 51 degrees F (8.8 to 10.6 degrees C)

*Frost-free period:* 120 to 150 days

### ***Map Unit Composition***

Desario and similar soils: 50 percent

Espadon and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Desario soils**

*Landscape:* Foothills (fig. 82)

*Landform:* South-facing low hills (fig. 83)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium and/or residuum weathered from limestone

*Slope:* 5 to 45 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 80 percent angular channers

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 12 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Fallugia paradoxa-

Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis

*Potential native vegetation:* twoneedle pinyon, sideoats grama, oneseed juniper, blue grama

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 1 inch; extremely gravelly loam

Bk1—1 inch to 3 inches; cobbly loam

Bk2—3 to 12 inches; very cobbly loam

R—12 to 22 inches; bedrock

#### **Espadon soils**

*Landscape:* Foothills (fig. 82)

*Landform:* North-facing low hills, cuevas (fig. 83)

*Position on landform:* Backslopes

*Parent material:* Colluvium and/or residuum weathered from limestone

*Slope:* 10 to 50 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 45 percent angular channers



*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 36 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis

*Potential native vegetation:* Gambel oak, twoneedle pinyon, needlegrass, oneseed juniper

*Land capability subclass (nonirrigated):* 4e

#### ***Typical Profile***

A—0 to 3 inches; very gravelly loam

Bt—3 to 9 inches; very gravelly loam

Bk1—9 to 16 inches; very gravelly loam

2Bk2—16 to 26 inches; extremely gravelly loam

2R—26 to 36 inches; bedrock

#### ***Minor Components Composition***

Rock outcrop: About 5 percent

Manzano and similar soils: About 2 percent

Cochiti and similar soils: About 1 percent

Pastorius and similar soils: About 1 percent

Lazarus and similar soils: About 1 percent



**Figure 82.—An area of Desario-Espadon complex, 5 to 50 percent slopes, in the background, that has a thick tree cover. An area of Lazarus-Manzano complex, 0 to 8 percent slopes, flooded, in the foreground, that has a thick grass cover.**

# Soil Survey of Santa Fe County Area, New Mexico

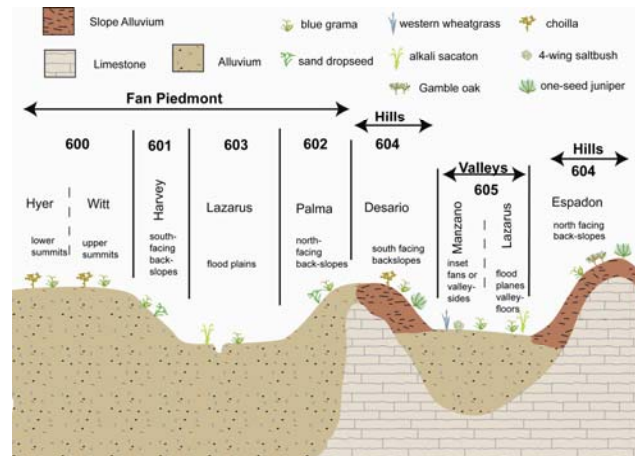


Figure 83.—Cross-section diagram of landform and landform position for map units south and east of South Mountain in the Estancia Basin.

## **605—Lazarus-Manzano complex, 0 to 8 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 7,300 feet (1,951 to 2,225 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Lazarus and similar soils: 50 percent

Manzano and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Lazarus soils**

*Landscape:* Foothills (fig. 82)

*Landform:* Flood plains on valley floors (fig. 83)

*Parent material:* Alluvium derived from limestone, sandstone, and shale

*Slope:* 0 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent (shape or size unspecified)

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.8 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Flooding hazard:* Occasional

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand  
dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; silt loam

Bt1—3 to 8 inches; silty clay loam

Bt2—8 to 17 inches; silty clay loam

Btk1—17 to 27 inches; silty clay loam

Btk2—27 to 53 inches; silty clay loam

Btk3—53 to 82 inches; silt loam

#### **Manzano soils**

*Landscape:* Foothills (fig. 82)

*Landform:* Inset fans on valley sides (fig. 83)

*Parent material:* Slope alluvium derived from limestone, sandstone, and shale

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*Slope:* 4 to 8 percent

*Shape (down/across):* Concave/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.1 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Flooding hazard:* Frequent

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 8 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Bottomland

*Potential native vegetation:* alkali sacaton, western wheatgrass, blue grama, fourwing  
saltbush, cholla

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 2 inches; silt loam

A2—2 to 8 inches; gravelly loam

A3—8 to 19 inches; gravelly loam

A4—19 to 43 inches; gravelly loam

Btb—43 to 62 inches; silty clay loam

Btkb—62 to 84 inches; silty clay loam

### ***Minor Components Composition***

Desario and similar soils: About 5 percent

Espadon and similar soils: About 3 percent

Riverwash: About 2 percent

## **606—Pastura-Nala complex, 3 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Nala and similar soils: 50 percent

Pastura and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Pastura soils**

*Landscape:* Intermontane basins (fig. 84)

*Landform:* Interfluvies on undulating plains (fig. 85, fig. 86, and fig. 94)

*Position on landform:* Shoulders

*Parent material:* Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, schist, and limestone

*Slope:* 3 to 5 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 50 percent rounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 12 to 16 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 0.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 78 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 1 inch; very gravelly very fine sandy loam

Bk1—1 inch to 5 inches; gravelly loam

Bk2—5 to 7 inches; very gravelly loam

Bk3—7 to 15 inches; very gravelly sandy loam

Bkkm1—15 to 22 inches; cemented material

Bkkm2—22 to 32 inches; cemented material

#### **Nala soils**

*Landscape:* Intermontane basins (fig. 84)

*Landform:* Interfluvies on undulating plains (fig. 85, fig. 86, and fig. 94)

*Position on landform:* Footslopes

*Parent material:* Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, and schist

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*Slope:* 8 to 15 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 1 percent subangular cobbles; about 30 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 4.6 inches (low)

*Shrink-swell potential:* About 0.8 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Limy

*Potential native vegetation:* New Mexico feathergrass, blue grama, winterfat, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 2 inches; gravelly sandy loam

Bw—2 to 7 inches; gravelly sandy loam

Bk1—7 to 19 inches; gravelly sandy loam

Bk2—19 to 33 inches; gravelly sandy loam

Bk3—33 to 49 inches; gravelly sandy loam

2Ck—49 to 82 inches; extremely gravelly coarse sand

### **Minor Components Composition**

Arojomil and similar soils: About 5 percent

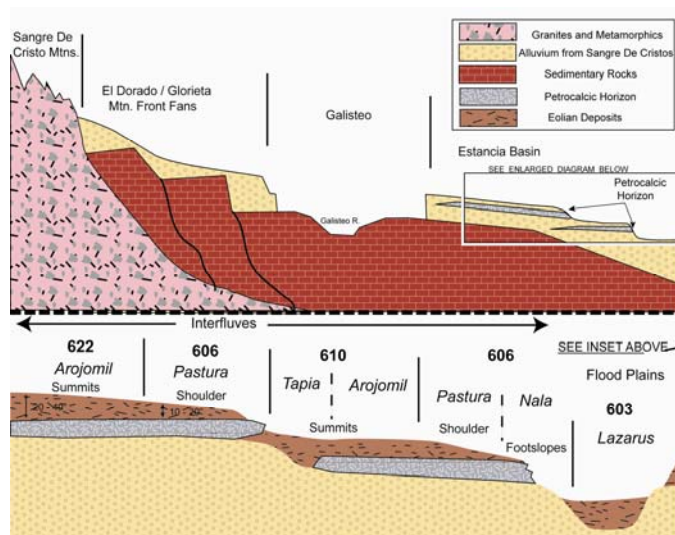
Kinsell and similar soils: About 3 percent

Raydawn and similar soils: About 2 percent

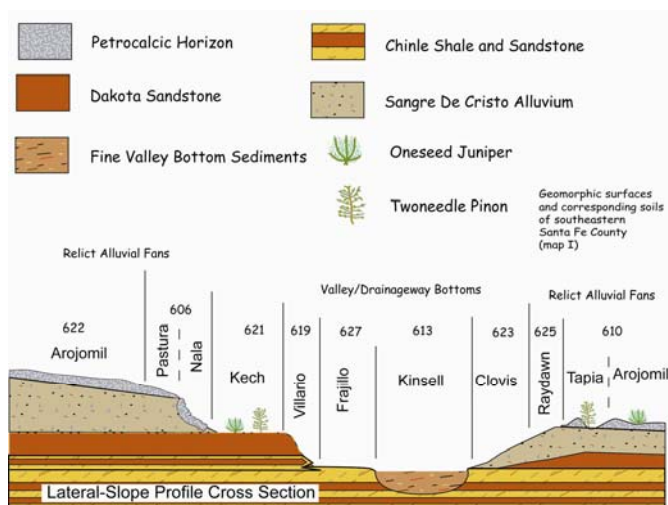


**Figure 84.**—An area of Pastura-Nala complex, 3 to 15 percent slopes. Petrocalcic material (caliche) is exposed in many areas. The Sandia Mountains are on the skyline on the left, and the South Mountains, San Pedro Mountains, and Ortiz Mountains are closer from left to right.

## Soil Survey of Santa Fe County Area, New Mexico



**Figure 85.—Cross-section diagram of landform and landform position for showing geology from the Sangre de Cristo Mountains southward to the Estancia Basin. The bottom part shows the geology under several map units in the Estancia Basin.**



**Figure 86.—Cross-section diagram of landform and landform position for several map units in the Estancia Basin around the White Lakes area.**

## **607—Davishat-Palma complex, 1 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Davishat and similar soils: 45 percent

Palma and similar soils: 45 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Davishat soils**

*Landscape:* Intermontane basins

*Landform:* Undulating dunes on plains (fig. 87)

*Position on landform:* Toeslopes

*Position on landform:* Dip

*Parent material:* Eolian deposits and slope alluvium derived from sandstone and shale

*Slope:* 1 to 8 percent

*Shape (down/across):* Linear/convex

*Surface fragments:* About 1 percent (shape or size unspecified)

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.9 inches (moderate)

*Shrink-swell potential:* About 1.8 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Deep Sand

*Potential native vegetation:* blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loamy very fine sand

Bw—2 to 12 inches; loamy very fine sand

Bt—12 to 28 inches; fine sandy loam

Btk—28 to 57 inches; fine sandy loam

BCK—57 to 87 inches; fine sandy loam

#### **Palma soils**

*Landscape:* Intermontane basins

*Landform:* Undulating dunes on plains (fig. 87)

*Position on landform:* Toeslopes, summits

*Position on landform:* Rise

*Parent material:* Eolian deposits and slope alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent



## Soil Survey of Santa Fe County Area, New Mexico

*Shape (down/across):* Convex/convex

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.7 inches (moderate)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 60 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Sandy

*Potential native vegetation:* blue grama, sideoats grama, galleta

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 4 inches; fine sandy loam

Bt1—4 to 11 inches; fine sandy loam

Bt2—11 to 23 inches; fine sandy loam

Btk—23 to 43 inches; very fine sandy loam

Bk—43 to 79 inches; very paragravelly sandy loam

### **Minor Components Composition**

Tamarindo and similar soils: About 5 percent

Raydawn and similar soils: About 3 percent

Davishat and similar soils: About 2 percent

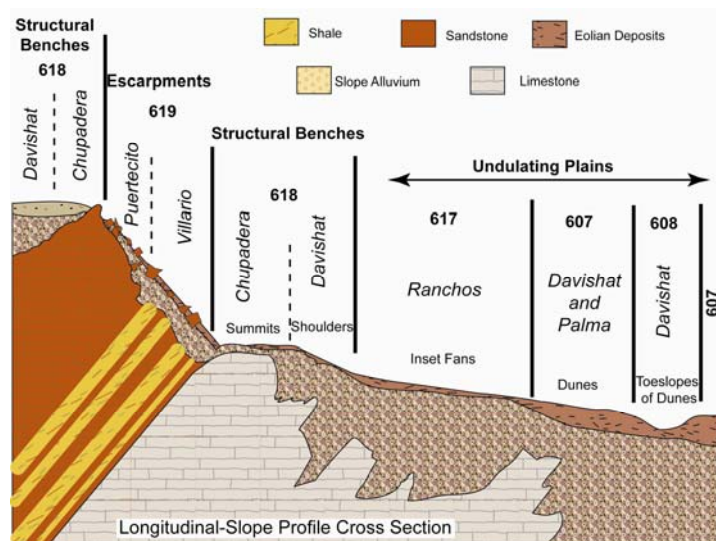


Figure 87.—Cross-section diagram of landform and landform position for map units in the central to eastern side of the Estancia Basin.

## **608—Davishat loamy very fine sand, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,100 feet (1,890 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Davishat and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Davishat soils**

*Landscape:* Intermontane basins

*Landform:* Undulating interdunes on plains (fig. 87)

*Position on landform:* Toeslopes

*Parent material:* Eolian deposits and slope alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/concave

*Surface fragments:* About 2 percent (shape or size unspecified)

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.6 inches (moderate)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Deep Sand

*Potential native vegetation:* blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; loamy very fine sand

Bw—3 to 10 inches; very fine sandy loam

Bt—10 to 41 inches; fine sandy loam

BCK—41 to 79 inches; gravelly sandy loam

### ***Minor Components Composition***

Palma and similar soils: About 5 percent

Tamarindo and similar soils: About 3 percent

Davishat and similar soils: About 2 percent

## **610—Arojomil-Tapia complex, 1 to 5 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Arojomil and similar soils: 50 percent

Tapia and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Arojomil soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 85 and fig. 86)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and siltstone over alluvium derived from granite, gneiss, and schist

*Slope:* 3 to 5 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 35 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 4.5 inches (low)

*Shrink-swell potential:* About 3.6 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 60 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

B—2 to 10 inches; clay loam

B—10 to 15 inches; loam

B1—15 to 22 inches; very gravelly loam

B2—22 to 33 inches; very gravelly loam

Bkkm1—33 to 41 inches; cemented material

Bkkm2—41 to 46 inches; cemented material

### **Tapia soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 85 and fig. 86)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and siltstone over alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 6.7 inches (moderate)

*Shrink-swell potential:* About 2.4 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 33 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 2 inches; silt loam

Bt—2 to 8 inches; silt loam

Btk—8 to 20 inches; gravelly silt loam

Bk1—20 to 30 inches; gravelly sandy loam

Bk2—30 to 52 inches; extremely cobbly loam

Bk3—52 to 67 inches; gravelly loam

Bk4—67 to 100 inches; very gravelly very fine sandy loam

### **Minor Components Composition**

Pastura and similar soils: About 5 percent

Nala and similar soils: About 4 percent

Raydawn and similar soils: About 1 percent

## **611—Spyglass silt loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 6,900 feet (1,890 to 2,103 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Spyglass and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Spyglass soils**

*Landscape:* Intermontane basins

*Landform:* Flood plain steps on basin floors (fig. 88)

*Parent material:* Alluvium and/or lacustrine deposits derived from sandstone, shale, and gypsum

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.7 inches (high)

*Shrink-swell potential:* About 3.8 percent (moderate)

*Flooding hazard:* Rare

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* About 50 percent

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Gyp Upland

*Potential native vegetation:* alkali sacaton, blue grama, fourwing saltbush, sideoats grama, ephedra

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; very fine sandy loam

Bt1—2 to 11 inches; clay

Bt2—11 to 20 inches; clay

Btk—20 to 23 inches; clay

2ABk—23 to 26 inches; clay

2By1—26 to 30 inches; loam

2By2—30 to 46 inches; loam

2By3—46 to 67 inches; clay loam

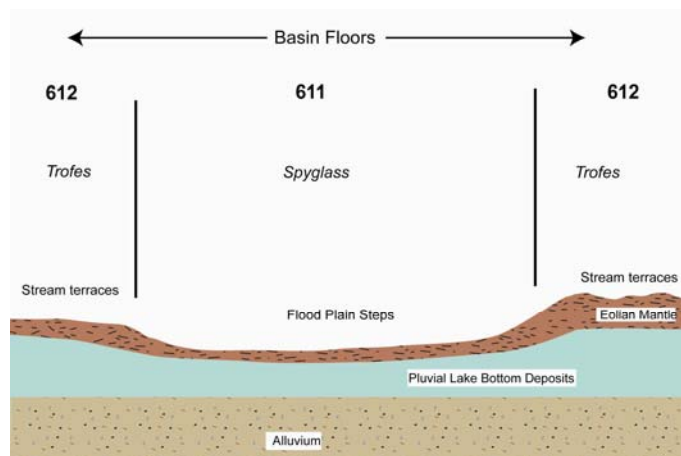
3BCK—67 to 108 inches; very gravelly sand

***Minor Components Composition***

Trofes and similar soils: About 5 percent

Tamarindo and similar soils: About 3 percent

Hyer and similar soils: About 2 percent



**Figure 88.—Cross-section diagram of landform and landform position for map units in fluvial lake bottom sequences of the Estancia Basin.**

## **612—Trofes loam, 0 to 2 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 6,900 feet (1,890 to 2,103 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Trofes and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Trofes soils**

*Landscape:* Intermontane basins

*Landform:* Low stream terraces on basin floors (fig. 88)

*Parent material:* Alluvium and/or lacustrine deposits derived from sandstone, shale, and gypsum

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 11.5 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 17 percent

*Gypsum average in horizon of maximum accumulation:* About 14 percent

*Salinity average in horizon of maximum accumulation:* About 8 mmhos/cm (moderately saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 9 (slightly sodic)

*Ecological site:* Gyp Upland

*Potential native vegetation:* alkali sacaton, blue grama, fourwing saltbush, sideoats grama, ephedra

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt—2 to 9 inches; clay loam

Btk1—9 to 15 inches; clay loam

Btk2—15 to 23 inches; clay loam

Btky1—23 to 41 inches; clay loam

Btky2—41 to 55 inches; clay loam

Bky—55 to 72 inches; fine sandy loam

By1—72 to 76 inches; clay loam

By2—76 to 80 inches; clay loam

2BCy—80 to 98 inches; loamy sand

***Minor Components Composition***

Spyglass and similar soils: About 5 percent  
Tamarindo and similar soils: About 3 percent  
Nala and similar soils: About 2 percent



## **613—Kinsell silt loam, 0 to 2 percent slopes, flooded**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Kinsell and similar soils: 85 percent

Minor components: 15 percent

### ***Component Descriptions***

#### **Kinsell soils**

*Landscape:* Intermontane basins

*Landform:* Flood plains on valley floors (fig. 86, fig. 89, and fig. 92)

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 0 to 2 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.7 inches (high)

*Shrink-swell potential:* About 5.9 percent (moderate)

*Flooding hazard:* Occasional

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, sand dropseed, broom snakeweed,  
ring muhly

*Land capability subclass (irrigated):* 2e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; silt loam

Bt1—2 to 8 inches; silt loam

Bt2—8 to 17 inches; silt loam

Bt3—17 to 32 inches; silt loam

Btk1—32 to 43 inches; silty clay loam

Btk2—43 to 80 inches; silty clay loam

### ***Minor Components Composition***

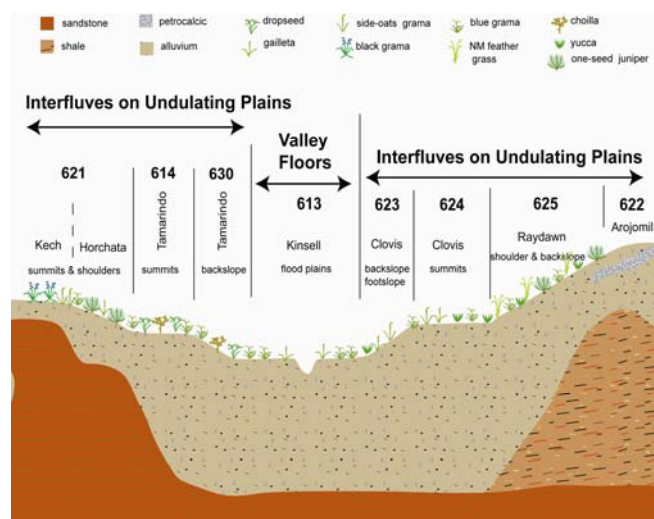
Kinsell and similar soils: About 9 percent

Tamarindo and similar soils: About 4 percent

Gullied land: About 1 percent

Riverwash: About 1 percent

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**Figure 89.—Cross-section diagram of landform and landform position for map units on the eastern side of the Estancia Basin.**

## **614—Tamarindo loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,100 feet (1,890 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Tamarindo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Tamarindo soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 89 and fig. 92)

*Position on landform:* Summits

*Parent material:* Eolian material and alluvium derived from sandstone and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.5 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand  
dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; loam

AB—4 to 9 inches; loam

Bt—9 to 16 inches; clay loam

Btk1—16 to 24 inches; clay loam

Btk2—24 to 38 inches; loam

Btk3—38 to 83 inches; loam

### ***Minor Components Composition***

Harvey and similar soils: About 3 percent

Palma and similar soils: About 3 percent

Witt and similar soils: About 2 percent

Clovis and similar soils: About 2 percent

## **615—Kwahe-Stanley complex, 0 to 1 percent slopes, ponded**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Kwahe and similar soils: 55 percent

Stanley and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Kwahe soils**

*Landscape:* Intermontane basins

*Landform:* Playa steps on playas (fig. 90)

*Position on landform:* Talf

*Parent material:* Lacustrine deposits derived from clayey shale

*Slope:* 0 to 1 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Poorly drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 8.8 inches (moderate)

*Shrink-swell potential:* About 9.5 percent (very high)

*Ponding hazard:* Occasional

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 17 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 8 (slightly sodic)

*Ecological site:* Swale

*Potential native vegetation:* western wheatgrass, galleta, blue grama, fourwing saltbush

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; clay

Bss—3 to 15 inches; clay

Bssg1—15 to 30 inches; clay

Bssg2—30 to 45 inches; clay

Bssg3—45 to 59 inches; clay

#### **Stanley soils**

*Landscape:* Intermontane basins

*Landform:* Playa floors on playas (fig. 90)

*Position on landform:* Dip

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*Parent material:* Lacustrine deposits derived from clayey shale

*Slope:* 0 to 1 percent

*Shape (down/across):* Concave/concave

*Surface fragments:* About 2 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Poorly drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 8.3 inches (moderate)

*Shrink-swell potential:* About 10.0 percent (very high)

*Ponding hazard:* Occasional

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* About 1 percent

*Salinity average in horizon of maximum accumulation:* About 6 mmhos/cm (slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Salty Bottomland

*Potential native vegetation:* western wheatgrass, scarlet globemallow

*Land capability subclass (nonirrigated):* 6c

### Typical Profile

A—0 to 3 inches; clay

Bsszg1—3 to 17 inches; clay

Bsszg2—17 to 28 inches; clay

Bsszg3—28 to 38 inches; clay

Bsszg4—38 to 56 inches; clay

Bssyzg—56 to 101 inches; clay

### Minor Components Composition

Triane and similar soils: About 5 percent

Clovis and similar soils: About 3 percent

Tamarindo and similar soils: About 2 percent

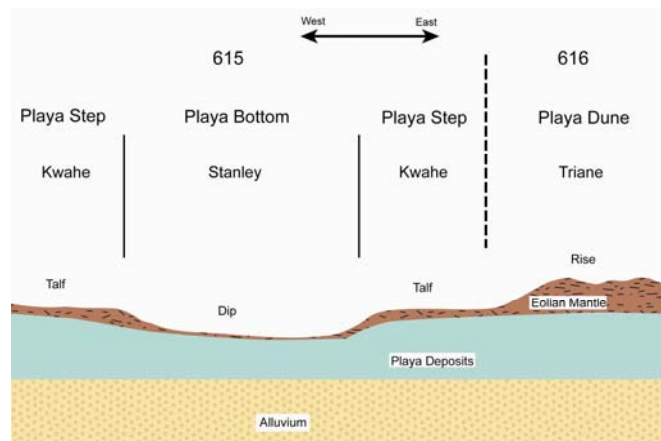


Figure 90.—Cross-section diagram of landform and landform position for map units in playa sequences of the Estancia Basin.

## **616—Triane silty clay loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,200 feet (1,890 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 150 to 170 days

### ***Map Unit Composition***

Triane and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Triane soils**

*Landscape:* Intermontane basins

*Landform:* Playa rims on playas (fig. 90)

*Position on landform:* Rise

*Parent material:* Eolian deposits derived from clayey shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Convex/linear

*Depth class:* Very deep

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 8.7 inches (moderate)

*Shrink-swell potential:* About 10.0 percent (very high)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 24 percent

*Gypsum average in horizon of maximum accumulation:* About 3 percent

*Salinity average in horizon of maximum accumulation:* About 11 mmhos/cm  
(moderately saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 18  
(moderately sodic)

*Ecological site:* Bottomland

*Potential native vegetation:* alkali sacaton, western wheatgrass, blue grama, fourwing  
saltbush, cholla

*Land capability subclass (irrigated):* 3e

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A1—0 to 2 inches; silty clay loam

A2—2 to 4 inches; silty clay loam

Btyz—4 to 14 inches; clay

Byzg1—14 to 27 inches; clay

Byzg2—27 to 42 inches; clay

2BCzg—42 to 59 inches; clay

### ***Minor Components Composition***

Kwahe and similar soils: About 4 percent

Stanley and similar soils: About 3 percent

Clovis and similar soils: About 2 percent

Tamarindo and similar soils: About 1 percent

## **617—Ranchos fine sandy loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,300 to 7,000 feet (1,920 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Ranchos and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Ranchos soils**

*Landscape:* Intermontane basins

*Landform:* Undulating inset fans on plains (fig. 87)

*Parent material:* Alluvium and eolian deposits and alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/convex

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 7.9 inches (moderate)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Very low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, sand dropseed, broom snakeweed, ring muhly

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

BA—2 to 9 inches; fine sandy loam

Bt—9 to 21 inches; fine sandy loam

Btk—21 to 30 inches; fine sandy loam

Bk1—30 to 50 inches; sandy loam

Bk2—50 to 85 inches; fine sandy loam

Bk3—85 to 100 inches; fine sandy loam

### ***Minor Components Composition***

Davishat and similar soils: About 5 percent

Chupadera and similar soils: About 3 percent

Clovis and similar soils: About 2 percent

## **618—Davishat-Chupadera complex, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 7,000 feet (1,951 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Davishat and similar soils: 55 percent

Chupadera and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Davishat soils**

*Landscape:* Intermontane basins

*Landform:* Structural benches on plateaus (fig. 87)

*Position on landform:* Footslopes

*Parent material:* Eolian deposits and alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent subrounded gravel; about 1 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 85 to 91 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 8.3 inches (moderate)

*Shrink-swell potential:* About 3.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

Bt—2 to 11 inches; fine sandy loam

Btk1—11 to 17 inches; fine sandy loam

Btk2—17 to 31 inches; fine sandy loam

Btk3—31 to 49 inches; fine sandy loam

Btk4—49 to 71 inches; very fine sandy loam

Btk5—71 to 87 inches; very fine sandy loam

R—87 to 97 inches; cemented bedrock



### **Chupadera soils**

*Landscape:* Intermontane basins

*Landform:* Structural benches on plateaus (fig. 87)

*Position on landform:* Summits, shoulders

*Parent material:* Eolian material and alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 1 percent subrounded gravel; about 1 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 24 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 3.6 inches (low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 15 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 1  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 1 inch; fine sandy loam

Bw—1 inch to 12 inches; fine sandy loam

Bk1—12 to 20 inches; sandy loam

Bk2—20 to 35 inches; sandy loam

2R—35 to 40 inches; bedrock

### **Minor Components Composition**

Ranchos and similar soils: About 5 percent

Clovis and similar soils: About 3 percent

Tamarindo and similar soils: About 2 percent

## **619—Villario-Puertecito complex, 25 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,000 to 7,100 feet (1,829 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Villario and similar soils: 60 percent

Puertecito and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Villario soils**

*Landscape:* Intermontane basins (fig. 91)

*Landform:* Scarp slopes on plateaus, scarp slopes on mesas (fig. 86 and fig. 87)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 30 to 45 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 8 percent subrounded boulders; about 10 percent subrounded stones; about 10 percent subrounded cobbles; about 15 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.3 inches (very low)

*Shrink-swell potential:* About 3.0 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shallow

*Potential native vegetation:* galleta, sideoats grama, black grama, blue grama, wolftail

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 3 inches; very stony silt loam

Bt—3 to 8 inches; silty clay loam

2BC—8 to 14 inches; silt loam

2Cr—14 to 24 inches; cemented bedrock

#### **Puertecito soils**

*Landscape:* Intermontane basins (fig. 91)

*Landform:* Dipslopes on plateaus (fig. 86 and fig. 87)

*Position on landform:* Backslopes

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*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone  
*Slope:* 1 to 5 percent  
*Shape (down/across):* Linear/linear  
*Depth class:* Moderately deep  
*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 3.7 inches (low)  
*Shrink-swell potential:* About 2.7 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate average in horizon of maximum accumulation:* About 32 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Loamy  
*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom snakeweed  
*Land capability subclass (nonirrigated):* 6c

### Typical Profile

A—0 to 4 inches; very fine sandy loam  
Bt—4 to 11 inches; loam  
Btk—11 to 17 inches; sandy clay loam  
Bk—17 to 28 inches; very cobbly sandy loam  
R—28 to 38 inches; cemented bedrock

### Minor Components Composition

Rock outcrop: About 5 percent  
Arojomil and similar soils: About 3 percent  
Villario and similar soils: About 2 percent

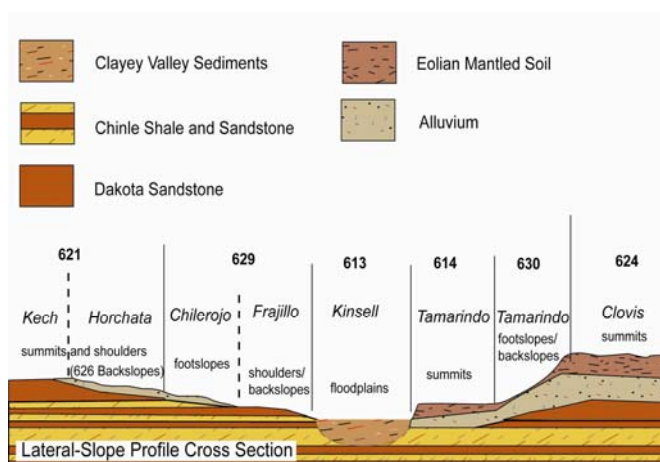


Figure 92.—Cross-section diagram of landform and landform position for map units on the eastern side of the Estancia Basin near White Lakes.

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*Parent material:* Colluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 25 to 45 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel; about 15 percent subrounded cobbles; about 6 percent subrounded stones; about 3 percent subrounded boulders

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 1.3 inches (very low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Hills

*Potential native vegetation:* black grama, little bluestem, oneseed juniper, sideoats grama

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 2 inches; very cobbly sandy loam

Bt1—2 to 6 inches; very cobbly sandy loam

Bt2—6 to 13 inches; very cobbly sandy clay loam

R—13 to 22 inches; cemented bedrock

### **Minor Components Composition**

Rock outcrop: About 5 percent

Badland: About 3 percent

Raydawn and similar soils: About 2 percent



**Figure 91.—An area of Villario-Puertecito complex, 25 to 45 percent slopes. Many large rock fragments cover this area.**

## **621—Kech-Horchata complex, 1 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 5,900 to 7,200 feet (1,798 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Kech and similar soils: 50 percent

Horchata and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Kech soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plateaus, interfluves on mesas (fig. 86, fig. 89, and fig. 92)

*Position on landform:* Shoulders, summits

*Parent material:* Eolian deposits derived from sandstone, shale, and limestone over residuum weathered from sandstone

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/linear

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 9 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shallow

*Potential native vegetation:* blue grama, sideoats grama, black grama, wolftail, galleta

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 4 inches; fine sandy loam

Bt—4 to 9 inches; fine sandy loam

Btk1—9 to 14 inches; loam

Btk2—14 to 18 inches; gravelly loam

2R—18 to 28 inches; cemented bedrock

#### **Horchata soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plateaus (fig. 87 and fig. 92)

*Position on landform:* Summits, shoulders

## **622—Arojomil silt loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,100 to 7,200 feet (1,859 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Arojomil and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Arojomil soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 85, fig. 86, and fig. 89)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over alluvium derived from mixed sources

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 24 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.001 to 0.06 in/hr (very slow)

*Available water capacity:* About 2.4 inches (very low)

*Shrink-swell potential:* About 3.1 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 52 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; silt loam (fig. 93)

Bt—2 to 8 inches; silt loam

Btk—8 to 14 inches; very gravelly loam

Bk—14 to 23 inches; extremely gravelly sandy loam

Bkkm—23 to 33 inches; cemented

### ***Minor Components Composition***

Tapia and similar soils: About 4 percent

Clovis and similar soils: About 2 percent

Raydawn and similar soils: About 2 percent

Tamarindo and similar soils: About 2 percent



**Figure 93.—Typical profile of Arojomil silt loam, 1 to 3 percent slopes.  
This well developed soil has a strong argillic horizon and very well  
developed calcic and petrocalcic horizon.**

## **623—Clovis loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,000 to 7,200 feet (1,829 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Clovis and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Clovis soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 86 and fig. 89)

*Position on landform:* Footslopes, backslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 8.7 inches (moderate)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 26 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 3  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom  
snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt—2 to 11 inches; loam

Btk1—11 to 22 inches; sandy clay loam

Btk2—22 to 32 inches; sandy clay loam

Bk1—32 to 42 inches; loam

Bk2—42 to 57 inches; gravelly sandy clay loam

Bk3—57 to 80 inches; very gravelly clay loam

### ***Minor Components Composition***

Chilerojo and similar soils: About 3 percent

Frajillo and similar soils: About 3 percent

Kinsell and similar soils: About 2 percent

Arojomil and similar soils: About 2 percent



## **624—Clovis very fine sandy loam, 1 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,500 to 7,200 feet (1,981 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Clovis and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Clovis soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 89 and fig. 92)

*Position on landform:* Summits

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 1 to 3 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Negligible

*Calcium carbonate average in horizon of maximum accumulation:* About 18 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; very fine sandy loam

Bt—2 to 9 inches; sandy clay loam

Btk—9 to 14 inches; clay loam

Bk1—14 to 27 inches; loam

Bk2—27 to 36 inches; loam

2Bk3—36 to 48 inches; sandy clay loam

2Bck—48 to 118 inches; fine sandy loam

### ***Minor Components Composition***

Tamarindo and similar soils: About 5 percent

Arojomil and similar soils: About 3 percent

Tapia and similar soils: About 2 percent

## **625—Raydawn very cobbly sandy loam, 15 to 35 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 7,100 feet (1,951 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Raydawn and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Raydawn soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plains (fig. 86 and fig. 89)

*Position on landform:* Shoulders, backslopes

*Position on landform:* Riser

*Parent material:* Alluvium derived from granite, gneiss, and schist over residuum weathered from sandstone and shale

*Slope:* 15 to 35 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* About 20 percent well rounded cobbles; about 30 percent well rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 5.6 inches (low)

*Shrink-swell potential:* About 4.7 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 46 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Gravelly

*Potential native vegetation:* black grama, galleta, sideoats grama, ephedra, oneseed juniper

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 6 inches; very cobbly sandy loam

Bk1—6 to 11 inches; very cobbly sandy loam

Bk2—11 to 30 inches; very gravelly loam

2Bk3—30 to 49 inches; very gravelly coarse sandy loam

3C—49 to 59 inches; silty clay loam

### ***Minor Components Composition***

Arojomil and similar soils: About 4 percent

Clovis and similar soils: About 3 percent

Tapia and similar soils: About 3 percent

## **626—Horchata loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 7,200 feet (1,951 to 2,195 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Horchata and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Horchata soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plains (fig. 94)

*Position on landform:* Backslopes

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent subrounded gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 5.3 inches (low)

*Shrink-swell potential:* About 3.1 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 20 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, ring muhly, sand dropseed, broom snakeweed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt1—2 to 5 inches; silt loam

Bt2—5 to 12 inches; silt loam

Btk—12 to 18 inches; silt loam

Bk—18 to 35 inches; sandy loam

2R—35 to 45 inches; bedrock

### ***Minor Components Composition***

Kech and similar soils: About 5 percent

Clovis and similar soils: About 3 percent

Tamarindo and similar soils: About 2 percent

## **627—Palabria-Frajillo complex, 1 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,400 to 7,100 feet (1,951 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Palabria and similar soils: 65 percent

Frajillo and similar soils: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Palabria soils**

*Landscape:* Intermontane basins

*Landform:* Structural benches (fig. 86 and fig. 94)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 1 to 8 percent

*Shape (down/across):* Linear/linear

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.1 inches (high)

*Shrink-swell potential:* About 3.4 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 13 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 4 (slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, sand dropseed, broom snakeweed, ring muhly

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; very fine sandy loam

Bt—2 to 11 inches; clay loam

Btk—11 to 18 inches; clay loam

Bk—18 to 30 inches; loam

BCK—30 to 41 inches; very fine sandy loam

2Ck—41 to 52 inches; extremely parachannery very fine sandy loam

2R—52 to 62 inches; bedrock

#### **Frajillo soils**

*Landscape:* Intermontane basins

*Landform:* Structural benches (fig. 87 and fig. 94)

## Soil Survey of Santa Fe County Area, New Mexico

*Position on landform:* Shoulders

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 1 to 5 percent

*Shape (down/across):* Convex/linear

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 3.6 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shallow Plains

*Potential native vegetation:* sideoats grama, New Mexico feathergrass, blue grama, big sagebrush, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### Typical Profile

A—0 to 2 inches; loam

Btk—2 to 13 inches; loam

Bk—13 to 18 inches; gravelly sandy loam

Cd—18 to 19 inches; bedrock

R—19 to 29 inches; bedrock

### Minor Components Composition

Chilerojo and similar soils: About 4 percent

Tamarindo and similar soils: About 3 percent

Clovis and similar soils: About 3 percent

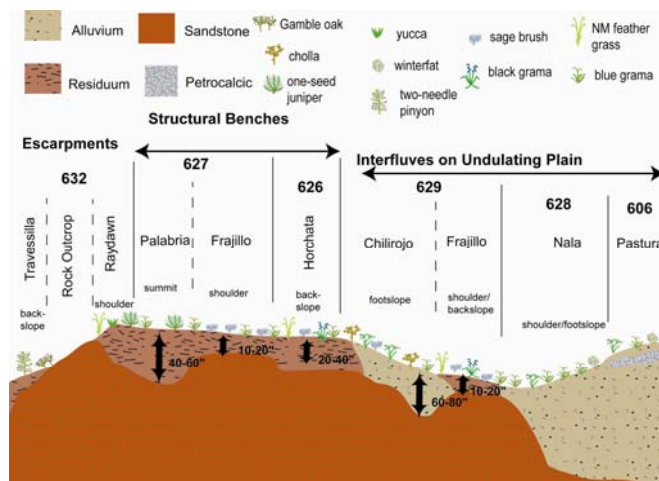


Figure 94.—Cross-section diagram of landform and landform position for map units on the eastern side of the Estancia Basin.

## **628—Nala gravelly sandy loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,000 feet (1,890 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 140 to 160 days

### ***Map Unit Composition***

Nala and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Nala soils**

*Landscape:* Intermontane basins (fig. 95)

*Landform:* Interfluves on undulating plains (fig. 94)

*Position on landform:* Shoulders, backslopes

*Parent material:* Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, and schist

*Slope:* 3 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 20 percent rounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 5.5 inches (low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 25 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Limy

*Potential native vegetation:* New Mexico feathergrass, blue grama, winterfat, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; gravelly fine sandy loam

Bk1—2 to 11 inches; gravelly fine sandy loam

Bk2—11 to 24 inches; gravelly sandy loam

Bk3—24 to 54 inches; gravelly sandy loam

BCK—54 to 81 inches; gravelly sandy loam

### ***Minor Components Composition***

Pastura and similar soils: About 5 percent

Arojomil and similar soils: About 3 percent

Tapia and similar soils: About 2 percent



**Figure 95.—An area of Nala gravelly sandy loam, 3 to 8 percent slopes. The Sandia Mountains are in the background on the left and the South Mountains on the right.**

## **629—Frajillo-Chilerojo complex, 5 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,100 feet (1,890 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Frajillo and similar soils: 55 percent

Chilerojo and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Frajillo soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plains (fig. 92 and fig. 94)

*Position on landform:* Backslopes, shoulders

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent subangular gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.0 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Shallow Plains

*Potential native vegetation:* sideoats grama, New Mexico feathergrass, blue grama,  
big sagebrush, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; sandy loam

Btk1—3 to 7 inches; sandy clay loam

2Btk2—7 to 10 inches; extremely paragravelly sandy clay loam

2Btk3—10 to 13 inches; paragravelly sandy clay loam

2R—13 to 23 inches; cemented bedrock

#### **Chilerojo soils**

*Landscape:* Intermontane basins

*Landform:* Interfluves on undulating plains (fig. 92)

*Position on landform:* Footslopes



## Soil Survey of Santa Fe County Area, New Mexico

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from sandstone  
*Slope:* 5 to 8 percent  
*Shape (down/across):* Concave/linear  
*Surface fragments:* About 3 percent subrounded gravel  
*Depth class:* Very deep  
*Depth to restrictive feature:* 59 to 79 inches to densic material  
*Drainage class:* Well drained  
*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)  
*Available water capacity:* About 10.1 inches (high)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Low  
*Calcium carbonate average in horizon of maximum accumulation:* About 9 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 3 mmhos/cm (very slightly saline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Loamy  
*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed  
*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 2 inches; fine sandy loam  
Bt—2 to 9 inches; loam  
Btk1—9 to 16 inches; loam  
Btk2—16 to 29 inches; gravelly clay loam  
Bk1—29 to 38 inches; gravelly clay loam  
2Bk2—38 to 46 inches; clay loam  
2Ctk—46 to 60 inches; very paragravelly clay loam  
2Cd—60 to 80 inches; cemented

### **Minor Components Composition**

Tamarindo and similar soils: About 4 percent  
Clovis and similar soils: About 3 percent  
Palabria and similar soils: About 3 percent

## **630—Tamarindo loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 6,200 to 7,100 feet (1,890 to 2,164 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 150 days

### ***Map Unit Composition***

Tamarindo and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Tamarindo soils**

*Landscape:* Intermontane basins

*Landform:* Interfluvies on undulating plains (fig. 89 and fig. 92)

*Position on landform:* Footslopes, backslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 3 to 8 percent

*Shape (down/across):* Concave/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.6 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2  
(slightly sodic)

*Ecological site:* Loamy

*Potential native vegetation:* blue grama, galleta, broom snakeweed, ring muhly, sand dropseed

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 2 inches; loam

Bt—2 to 13 inches; loam

Btk1—13 to 22 inches; clay loam

Btk2—22 to 35 inches; loam

Btk3—35 to 49 inches; loam

Btk4—49 to 74 inches; loam

Bk—74 to 110 inches; loam

2C—110 to 123 inches; gravelly loam

### ***Minor Components Composition***

Arojomil and similar soils: About 5 percent

Kinsell and similar soils: About 3 percent

Clovis and similar soils: About 2 percent

## **632—Travessilla-Raydawn-Sandoval-Rock outcrop complex, 5 to 45 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70C

*Elevation:* 5,800 to 7,000 feet (1,767 to 2,134 meters)

*Mean annual precipitation:* 12 to 14 inches (305 to 356 millimeters)

*Mean annual air temperature:* 49 to 51 degrees F (9.4 to 10.6 degrees C)

*Frost-free period:* 130 to 160 days

### ***Map Unit Composition***

Travessilla and similar soils: 35 percent

Raydawn and similar soils: 25 percent

Sandoval and similar soils: 15 percent

Rock outcrop: 10 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Travessilla soils**

*Landscape:* Intermontane basins

*Landform:* Escarpments (fig. 94)

*Position on landform:* Backslopes

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Convex/convex

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 2.6 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)

*Ecological site:* Shallow Plains

*Potential native vegetation:* sideoats grama, New Mexico feathergrass, blue grama

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 1 inch; fine sandy loam

Bk1—1 inch to 7 inches; fine sandy loam

Bk2—7 to 15 inches; paragravelly fine sandy loam

2R—15 to 25 inches; cemented bedrock

#### **Raydawn soils**

*Landscape:* Intermontane basins

*Landform:* Escarpments (fig. 94)

*Position on landform:* Shoulders

## Soil Survey of Santa Fe County Area, New Mexico

*Position on landform:* Riser  
*Parent material:* Slope alluvium derived from granite, gneiss, and schist  
*Slope:* 5 to 15 percent  
*Shape (down/across):* Convex/convex  
*Surface fragments:* About 20 percent well rounded cobbles; about 30 percent well rounded gravel  
*Depth class:* Very deep  
*Drainage class:* Well drained  
*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)  
*Available water capacity:* About 2.4 inches (very low)  
*Shrink-swell potential:* About 1.5 percent (low)  
*Runoff class:* Medium  
*Calcium carbonate average in horizon of maximum accumulation:* About 46 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Deep Sand  
*Potential native vegetation:* blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama  
*Land capability subclass (nonirrigated):* 6c

### **Typical Profile**

A—0 to 6 inches; very cobbly sandy loam  
Bk1—6 to 11 inches; very cobbly sandy loam  
Bk2—11 to 30 inches; very gravelly loam  
2Bk3—30 to 80 inches; very gravelly coarse sandy loam

### **Sandoval soils**

*Landscape:* Intermontane basins  
*Landform:* Escarpments (fig. 94)  
*Position on landform:* Shoulders, backslopes  
*Position on landform:* Riser  
*Parent material:* Residuum weathered from clayey shale and/or slope alluvium derived from clayey shale  
*Slope:* 15 to 45 percent  
*Shape (down/across):* Convex/convex  
*Surface fragments:* About 5 percent rounded cobbles; about 15 percent rounded medium and coarse gravel  
*Depth class:* Shallow  
*Depth to restrictive feature:* 10 to 20 inches to bedrock, paralithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)  
*Available water capacity:* About 1.5 inches (very low)  
*Shrink-swell potential:* About 4.5 percent (moderate)  
*Runoff class:* Very high  
*Calcium carbonate average in horizon of maximum accumulation:* About 2 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 2 (slightly sodic)  
*Ecological site:* Shale Hills

## Soil Survey of Santa Fe County Area, New Mexico

*Potential native vegetation:* alkali sacaton, broom snakeweed, fourwing saltbush, black grama

*Land capability subclass (nonirrigated):* 6c

### ***Typical Profile***

A—0 to 3 inches; gravelly sandy loam

C—3 to 11 inches; gravelly loam

Cr—11 to 21 inches; cemented bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed sandstone bedrock. It occurs as steeply sloping bedrock, ledges, and cliffs intermingled with the Travessilla and Sandoval soils.

*Landscape:* Intermontane basins

*Landform:* Escarpments

*Position on landform:* Riser

*Parent material:* Sandstone

*Slope:* 40 to 160 percent

*Shape (down/across):* Convex/convex

### ***Minor Components Composition***

Villario and similar soils: About 6 percent

Scarpine and similar soils: About 4 percent

## **700—Aliante-Altega complex, 1 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,600 to 7,900 feet (2,012 to 2,408 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Aliante and similar soils: 50 percent

Altega and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Aliante soils**

*Landscape:* Plateaus (fig. 96)

*Landform:* Interfluves on undulating plateaus (fig. 97)

*Position on landform:* Toeslopes, footslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 1 to 5 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.7 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail,  
fringed sagewort

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 1 inch; silt loam

Bt1—1 inch to 9 inches; silt loam

Bt2—9 to 19 inches; silt loam

Bt3—19 to 31 inches; silt loam

Bt4—31 to 39 inches; silt loam

Bt5—39 to 47 inches; silt loam

ABtb—47 to 65 inches; silty clay loam

BCb1—65 to 91 inches; clay

BCb2—91 to 111 inches; clay loam

**Altega soils**

*Landscape:* Plateaus (fig. 96)

*Landform:* Interfluves on undulating plateaus (fig. 97)

*Position on landform:* Summits, shoulders

*Parent material:* Eolian deposits derived from sandstone and shale over alluvium derived from sandstone and shale

*Slope:* 3 to 10 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 2 percent subangular gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 98 to 118 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.4 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort

*Land capability subclass (nonirrigated):* 4c

**Typical Profile**

A—0 to 2 inches; loam  
Bt1—2 to 9 inches; loam  
Bt2—9 to 19 inches; loam  
Btk—19 to 24 inches; loam  
BAtkb—24 to 29 inches; clay loam  
Btkb1—29 to 43 inches; clay loam  
Btkb2—43 to 58 inches; loam  
Bkb1—58 to 81 inches; loam  
Bkb2—81 to 101 inches; loam  
2R—101 to 111 inches; bedrock

**Minor Components Composition**

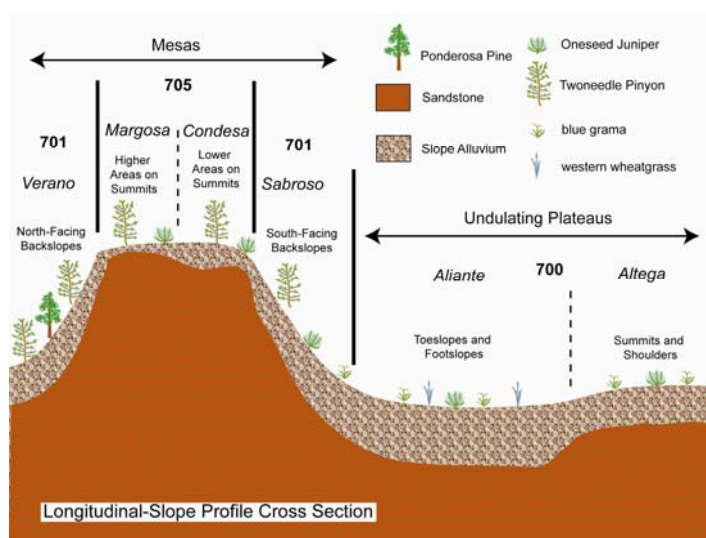
Condesa and similar soils: About 5 percent

Bernal and similar soils: About 3 percent

Altezita and similar soils: About 2 percent



**Figure 96.—An area of Aliante-Altega complex, 1 to 10 percent slopes.**  
This area was once covered with piñon and juniper trees, but they were mechanically removed in the late 1960's. The Altega soils are on higher areas adjacent to the Aliante soils.



**Figure 97.—Cross-section diagram of landform and landform position for map units on Glorieta Mesa in the south of Glorieta.**



## **701—Sabroso-Verano complex, 35 to 65 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,200 to 8,000 feet (1,890 to 2,438 meters)

*Mean annual precipitation:* 14 to 17 inches (356 to 432 millimeters)

*Mean annual air temperature:* 43 to 47 degrees F (6.1 to 8.3 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Sabroso and similar soils: 50 percent

Verano and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Sabroso soils**

*Landscape:* Plateaus

*Landform:* South-facing plateaus, mesas (fig. 97)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from sandstone and shale

*Slope:* 35 to 60 percent

*Shape (down/across):* Concave/convex

*Surface fragments:* About 2 percent subrounded stones; about 30 percent subrounded cobbles; about 35 percent subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 6.3 inches (moderate)

*Shrink-swell potential:* About 5.9 percent (moderate)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, Rocky Mountain juniper, muttongrass, ponderosa pine

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

A—0 to 2 inches; extremely cobbly loam

AB—2 to 6 inches; very gravelly loam

Bt1—6 to 10 inches; very gravelly clay loam

Bt2—10 to 15 inches; very gravelly clay loam

Bt3—15 to 25 inches; very gravelly clay loam

Bt4—25 to 33 inches; very gravelly clay loam

Btk1—33 to 48 inches; gravelly clay loam

Btk2—48 to 66 inches; very cobbly clay loam

2R—66 to 76 inches; bedrock

### **Verano soils**

*Landscape:* Plateaus

*Landform:* North-facing plateaus, mesas (fig. 97)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from sandstone, shale, and conglomerate

*Slope:* 35 to 65 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 30 percent subrounded gravel; about 20 percent subrounded cobbles; less than 1 percent subrounded stones; about 2 percent fine subrounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 59 to 79 inches to bedrock, paralithic; 79 to 98 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 5.5 inches (low)

*Shrink-swell potential:* About 6.8 percent (high)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-

Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, ponderosa pine, mountain muhly, Rocky Mountain juniper

*Land capability subclass (nonirrigated):* 7e

### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A—2 to 5 inches; very cobbly loam

BA—5 to 10 inches; very cobbly loam

Bt1—10 to 14 inches; very gravelly clay loam

Bt2—14 to 25 inches; very cobbly clay loam

Bt3—25 to 33 inches; very gravelly clay loam

Bt4—33 to 53 inches; very cobbly clay loam

Bt5—53 to 72 inches; very cobbly clay loam

2Cr—72 to 88 inches; bedrock

2R—88 to 98 inches; bedrock

### **Minor Components Composition**

Altega and similar soils: About 4 percent

Bernal and similar soils: About 3 percent

Altezita and similar soils: About 3 percent

## **702—Estrada-Chacuaco complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,400 to 8,000 feet (1,951 to 2,438 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Estrada and similar soils: 65 percent

Chacuaco and similar soils: 25 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Estrada soils**

*Landscape:* Plateaus (fig. 98)

*Landform:* Valley sides (fig. 99)

*Position on landform:* Toeslopes

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 2 to 8 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 1 percent angular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.1 inches (high)

*Shrink-swell potential:* About 5.3 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 1 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail,  
fringed sagewort

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A1—0 to 2 inches; very fine sandy loam

A2—2 to 7 inches; loam

Bt1—7 to 14 inches; silty clay loam

Bt2—14 to 23 inches; silty clay loam

Bt3—23 to 41 inches; gravelly clay loam

BCtk—41 to 57 inches; clay loam

Ck—57 to 87 inches; very gravelly loam

#### **Chacuaco soils**

*Landscape:* Plateaus (fig. 98)

*Landform:* Valley sides (fig. 99)

*Position on landform:* Footslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 2 to 6 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent angular gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 7.1 inches (moderate)

*Shrink-swell potential:* About 5.0 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 34 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail,  
fringed sagewort

*Land capability subclass (nonirrigated):* 4c

#### ***Typical Profile***

A1—0 to 2 inches; very fine sandy loam

A2—2 to 6 inches; loam

Bt1—6 to 16 inches; clay loam

Bt2—16 to 22 inches; clay loam

Bt3—22 to 28 inches; clay loam

Btk—28 to 33 inches; clay loam

Bk—33 to 41 inches; gravelly sandy clay loam

R—41 to 51 inches; bedrock

#### ***Minor Components Composition***

Aliante and similar soils: About 6 percent

Altega and similar soils: About 4 percent



**Figure 98.—An Area of Estrada-Chacuaco complex, 2 to 8 percent slopes. This site that benefits from run on moisture supports a very robust grass cover.**

# Soil Survey of Santa Fe County Area, New Mexico

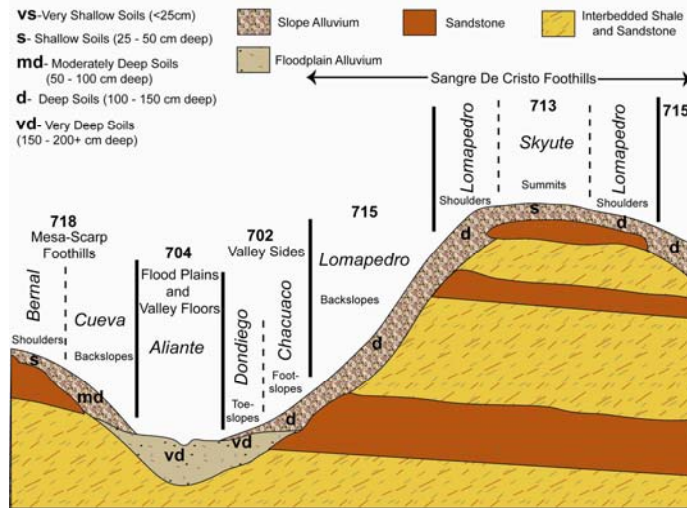


Figure 99.—Cross-section diagram of landform and landform position for map units south and east of Glorieta.

## **703—Estrada loam, 2 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,900 to 8,000 feet (2,103 to 2,438 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Estrada and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Estrada soils**

*Landscape:* Plateaus

*Landform:* Valley sides (fig. 102)

*Position on landform:* Footslopes, toeslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 2 to 15 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent subangular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.1 inches (high)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Flooding hazard:* Very rare

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail,  
fringed sagewort

*Land capability subclass (nonirrigated):* 4e

### ***Typical Profile***

A—0 to 2 inches; fine sandy loam

AB—2 to 4 inches; loam

Bt1—4 to 13 inches; loam

Bt2—13 to 19 inches; loam

Btk1—19 to 28 inches; loam

Btk2—28 to 41 inches; loam

B't1—41 to 55 inches; clay loam

B't2—55 to 104 inches; loam

BC—104 to 122 inches; loam

***Minor Components Composition***

Herrada and similar soils: About 4 percent

Riverwash: About 2 percent

Bernal and similar soils: About 2 percent

Estrada and similar soils: About 2 percent

## **704—Aliante loam, 0 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,500 to 7,900 feet (1,981 to 2,408 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Aliante and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Aliante soils**

*Landscape:* Plateaus

*Landform:* Flood plains on valley floors (fig. 99)

*Parent material:* Alluvium derived from sandstone and shale

*Slope:* 0 to 3 percent

*Shape (down/across):* Linear/linear

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.0 inches (high)

*Shrink-swell potential:* About 5.5 percent (moderate)

*Flooding hazard:* Rare

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(slightly sodic)

*Ecological site:* Loamy Upland

*Potential native vegetation:* blue grama, western wheatgrass, bottlebrush squirreltail,  
fringed sagewort

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 6 inches; loam

Bt1—6 to 11 inches; loam

Bt2—11 to 17 inches; silty clay loam

Bt3—17 to 36 inches; silty clay

Bt4—36 to 60 inches; clay loam

CB—60 to 79 inches; gravelly sandy clay loam

### ***Minor Components Composition***

Altega and similar soils: About 6 percent

Moriartche and similar soils: About 4 percent



## **705—Margosa-Condesa complex, 2 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,400 to 8,100 feet (1,951 to 2,469 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Margosa and similar soils: 50 percent

Condesa and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Margosa soils**

*Landscape:* Plateaus

*Landform:* Higher areas plateaus (fig. 97)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 2 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 10 percent subangular gravel; about 10 percent subangular cobbles; about 2 percent subrounded stones

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.7 inches (very low)

*Shrink-swell potential:* About 3.9 percent (moderate)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 72 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, needlegrass, oneseed juniper, Rocky Mountain juniper, blue grama

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 5 inches; cobbly loam

Bt—5 to 8 inches; cobbly clay loam

Btk—8 to 12 inches; gravelly clay loam

Bk—12 to 17 inches; extremely gravelly loam

2R—17 to 27 inches; bedrock

**Condesa soils**

*Landscape:* Plateaus

*Landform:* Lower areas, plateaus (fig. 97)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 2 to 6 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent (shape or size unspecified)

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to bedrock, paralithic; 20 to 39 inches to petrocalcic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 3.6 inches (low)

*Shrink-swell potential:* About 4.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 74 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, oneseed juniper, Rocky Mountain juniper, blue grama

*Land capability subclass (nonirrigated):* 4c

**Typical Profile**

A—0 to 2 inches; loam

Bt1—2 to 5 inches; loam

Bt2—5 to 10 inches; clay loam

Bt3—10 to 16 inches; loam

Btk—16 to 24 inches; loam

Bkkm—24 to 27 inches; petrocalcic

2Cr—27 to 37 inches; bedrock

**Minor Components Composition**

Rock outcrop: About 5 percent

Predawn and similar soils: About 3 percent

Bernal and similar soils: About 2 percent

## **706—Verano-Altezita complex, 45 to 90 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 49

*Elevation:* 6,800 to 8,100 feet (2,073 to 2,469 meters)

*Mean annual precipitation:* 15 to 18 inches (381 to 457 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 100 to 120 days

### ***Map Unit Composition***

Verano and similar soils: 65 percent

Altezita and similar soils: 30 percent

Minor components: 5 percent

### ***Component Descriptions***

#### **Verano soils**

*Landscape:* Plateaus (fig. 100 and fig. 101)

*Landform:* Lower north-facing escarpments (fig. 102)

*Position on landform:* Backslopes

*Parent material:* Colluvium derived from sandstone and shale

*Slope:* 45 to 65 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 10 percent subrounded gravel; about 20 percent subrounded cobbles; about 2 percent subrounded stones; about 1 percent subrounded stones

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 6.2 inches (moderate)

*Shrink-swell potential:* About 5.7 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, ponderosa pine, mountain muhly, Rocky Mountain juniper

*Land capability subclass (nonirrigated):* 7e

### ***Typical Profile***

Oi—0 to 1 inch; very stony slightly decomposed plant material

A1—1 inch to 4 inches; cobbly loam

A2—4 to 9 inches; cobbly sandy loam

E—9 to 13 inches; very cobbly fine sandy loam

Bt1—13 to 23 inches; very cobbly clay loam

Bt2—23 to 32 inches; very gravelly clay  
Bt3—32 to 40 inches; very gravelly clay loam  
BC—40 to 51 inches; clay loam  
Cr—51 to 61 inches; cemented

**Altezita soils**

*Landscape:* Plateaus (fig. 100 and fig. 101)  
*Landform:* Upper north-facing escarpments (fig. 102)  
*Position on landform:* Backslopes  
*Parent material:* Colluvium derived from sandstone over residuum weathered from sandstone  
*Slope:* 60 to 90 percent  
*Shape (down/across):* Convex/linear  
*Surface fragments:* About 2 percent subrounded stones; about 1 percent subrounded stones; about 20 percent subrounded cobbles; about 25 percent subrounded gravel  
*Depth class:* Shallow  
*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic  
*Drainage class:* Well drained  
*Slowest permeability:* 0.6 to 2.0 in/hr (moderate)  
*Available water capacity:* About 1.1 inches (very low)  
*Shrink-swell potential:* About 4.1 percent (moderate)  
*Runoff class:* High  
*Calcium carbonate average in horizon of maximum accumulation:* About 9 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)  
*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana  
*Potential native vegetation:* Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly, needlegrass  
*Land capability subclass (nonirrigated):* 5s

**Typical Profile**

Oi—0 to 1 inch; very gravelly slightly decomposed plant material  
A1—1 inch to 6 inches; very cobbly sandy loam  
A2—6 to 14 inches; very cobbly sandy clay loam  
BCk—14 to 18 inches; extremely cobbly sandy clay loam  
R—18 to 28 inches; bedrock

**Minor Components Composition**

Rock outcrop: About 3 percent  
Sabroso and similar soils: About 2 percent



**Figure 100.—An area of Verano-Altezita complex, 45 to 90 percent slopes. This steep north-facing slope supports a vegetative community of ponderosa pine and Gambel oak.**



**Figure 101.—An area of Verano-Altezita complex, 45 to 90 percent slopes. The Altezita soil is shallow to bedrock and has many large rock fragments covering the surface. A backpack is directly in front of the soil pit contains tools used to help characterize this soil.**

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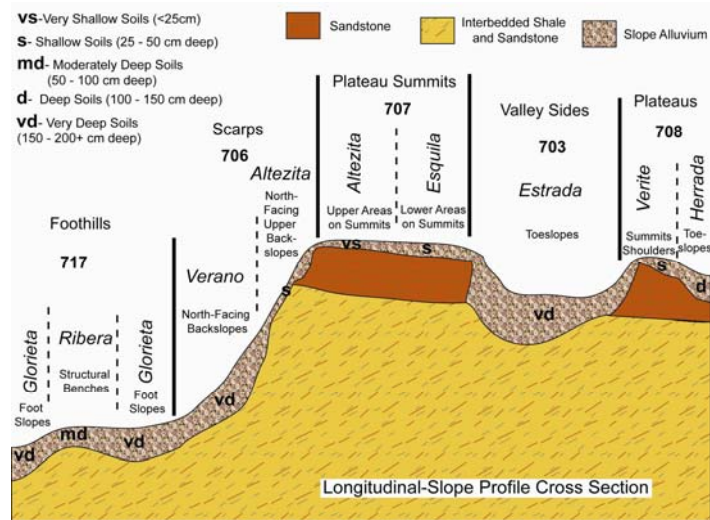


Figure 102.—Cross-section diagram of landform and landform position for map units on Glorieta Mesa and the northern escarpment south and east of Glorieta.

## **707—Altezita-Esquila-Rock outcrop complex, 2 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,700 to 8,100 feet (2,042 to 2,469 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 45 to 47 degrees F (7.2 to 8.3 degrees C)

*Frost-free period:* 110 to 130 days

### ***Map Unit Composition***

Altezita and similar soils: 50 percent

Esquila and similar soils: 30 percent

Rock outcrop: 10 percent

Minor components: 4 percent

### ***Component Descriptions***

#### **Altezita soils**

*Landscape:* Plateaus

*Landform:* Higher areas plateaus (fig. 102)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone over residuum weathered from sandstone

*Slope:* 5 to 10 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 2 percent subrounded gravel; about 1 percent subrounded stones

*Depth class:* Very shallow

*Depth to restrictive feature:* 1 to 10 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 0.7 inches (very low)

*Shrink-swell potential:* About 1.5 percent (low)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly, needlegrass

*Land capability subclass (nonirrigated):* 7s

### ***Typical Profile***

A—0 to 2 inches; cobbly loam

Bw—2 to 7 inches; sandy loam

2R—7 to 17 inches; bedrock

### **Esquila soils**

*Landscape:* Plateaus

*Landform:* Lower areas plateaus (fig. 102)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 2 to 5 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 2 percent subrounded gravel; about 5 percent subrounded cobbles

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 2.2 inches (very low)

*Shrink-swell potential:* About 5.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly

*Land capability subclass (nonirrigated):* 4s

#### **Typical Profile**

Oi—0 to 2 inches; slightly decomposed plant material

A1—2 to 3 inches; sandy loam

A2—3 to 7 inches; sandy loam

E—7 to 9 inches; loamy sand

Bt1—9 to 17 inches; clay

2Bt2—17 to 20 inches; very paragravelly clay

2R—20 to 30 inches; bedrock

### **Rock outcrop**

*Description:* Rock outcrop consists of exposed sandstone bedrock. It occurs as gently sloping bedrock intermingled with the Altezita and Esquila soils.

*Landscape:* Plateaus

*Landform:* Lower areas plateaus

*Parent material:* Sandstone

*Slope:* 5 to 15 percent

*Shape (down/across):* Linear/linear

#### **Minor Components Composition**

Bernal and similar soils: About 3 percent

Margosa and similar soils: About 1 percent



## **708—Uva-Herrada complex, 3 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,200 to 8,000 feet (1,890 to 2,438 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Uva and similar soils: 50 percent

Herrada and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Uva soils**

*Landscape:* Plateaus

*Landform:* Undulating plateaus (fig. 102)

*Position on landform:* Shoulders, summits

*Parent material:* Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 3 to 15 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* Less than 1 percent angular stones; about 10 percent angular gravel; about 10 percent cobbles

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 2.0 to 6.0 in/hr (moderately rapid)

*Available water capacity:* About 1.6 inches (very low)

*Shrink-swell potential:* About 2.0 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass

*Land capability subclass (nonirrigated):* 4e

### ***Typical Profile***

Oi—0 to 0 inch; cobbly slightly decomposed plant material

A—0 to 3 inches; cobbly loamy fine sand

Bt1—3 to 6 inches; sandy loam

Bt2—6 to 9 inches; paragravelly sandy loam

Btk/Crk—9 to 17 inches; sandy loam

R—17 to 27 inches; bedrock

**Herrada soils**

*Landscape:* Plateaus

*Landform:* Undulating plateaus (fig. 102)

*Position on landform:* Foothills

*Parent material:* Alluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 3 to 10 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 5 percent angular gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 79 to 98 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.5 inches (high)

*Shrink-swell potential:* About 4.3 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 3 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, ponderosa pine, Rocky Mountain juniper, twoneedle pinyon, Junegrass, blue grama

*Land capability subclass (nonirrigated):* 3c

**Typical Profile**

A—0 to 2 inches; loam  
AB—2 to 4 inches; loam  
BA—4 to 9 inches; loam  
Bt1—9 to 22 inches; loam  
Bt2—22 to 31 inches; clay loam  
Bt3—31 to 43 inches; silty clay loam  
Btk1—43 to 51 inches; loam  
Btk2—51 to 69 inches; loam  
2C—69 to 91 inches; silt loam  
3R—91 to 101 inches; bedrock

**Minor Components Composition**

Estrada and similar soils: About 5 percent  
Bernal and similar soils: About 3 percent  
Rock outcrop: About 2 percent

## **709—Moriartche clay loam, 0 to 3 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,600 to 7,300 feet (2,012 to 2,225 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Moriartche and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Moriartche soils**

*Landscape:* Plateaus

*Landform:* Alluvial flats on valley floors (fig. 105)

*Parent material:* Alluvium derived from shale

*Slope:* 0 to 3 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 1 percent angular gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 9.5 inches (high)

*Shrink-swell potential:* About 7.5 percent (high)

*Runoff class:* Medium

*Calcium carbonate average in horizon of maximum accumulation:* About 9 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Swale

*Potential native vegetation:* blue grama, western wheatgrass, fringed sagewort

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 1 inch; clay loam

BA—1 inch to 4 inches; clay loam

Bw—4 to 14 inches; clay

Bss1—14 to 27 inches; silty clay loam

Bss2—27 to 88 inches; silty clay

### ***Minor Components Composition***

Aliante and similar soils: About 5 percent

Altega and similar soils: About 4 percent

Water: About 1 percent

## **710—Predawn fine sandy loam, 1 to 4 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

*Elevation:* 6,600 to 8,000 feet (2,012 to 2,438 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Predawn and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Predawn soils**

*Landscape:* Plateaus

*Landform:* Eroded fan remnants (fig. 105)

*Position on landform:* Summits

*Parent material:* Eolian deposits derived from sandstone and shale over alluvium derived from granite, gneiss, and schist

*Slope:* 1 to 4 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 1 percent subrounded gravel

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.06 to 0.2 in/hr (slow)

*Available water capacity:* About 10.6 inches (high)

*Shrink-swell potential:* About 5.2 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 20 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 1 inch; fine sandy loam

BA—1 inch to 3 inches; clay loam

Bt—3 to 16 inches; clay loam

Btk1—16 to 25 inches; clay loam

Btk2—25 to 33 inches; clay loam

2Bk—33 to 49 inches; clay loam

2Btk3—49 to 66 inches; clay loam

2Btk4—66 to 119 inches; loam

***Minor Components Composition***

Fangio and similar soils: About 5 percent

Herrada and similar soils: About 3 percent

Urraca and similar soils: About 2 percent

## 711—Fangio-Ortiz complex, 15 to 50 percent slopes

### *Map Unit Setting*

*Major Land Resource Area:* 70A

*Elevation:* 6,600 to 8,000 feet (2,012 to 2,438 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### *Map Unit Composition*

Fangio and similar soils: 50 percent

Ortiz and similar soils: 40 percent

Minor components: 10 percent

### *Component Descriptions*

#### **Fangio soils**

*Landscape:* Plateaus (fig. 103 and fig. 104)

*Landform:* Upper eroded fan remnants (fig. 105)

*Position on landform:* Backslopes

*Parent material:* Alluvium and colluvium derived from granite, gneiss, and schist over residuum weathered from shale

*Slope:* 15 to 50 percent

*Shape (down/across):* Convex/convex

*Surface fragments:* Less than 1 percent rounded stones; about 30 percent rounded cobbles; about 35 percent rounded gravel

*Depth class:* Very deep

*Depth to restrictive feature:* 69 to 94 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 8.3 inches (moderate)

*Shrink-swell potential:* About 6.0 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 35 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, black grama, sideoats grama, blue grama

*Land capability subclass (nonirrigated):* 7s

### *Typical Profile*

A—0 to 4 inches; extremely cobbly loam (fig. 106)

AB—4 to 8 inches; extremely cobbly loam

Btk1—8 to 12 inches; very cobbly loam

Btk2—12 to 20 inches; very cobbly clay loam

Btk3—20 to 28 inches; cobbly clay loam

BCK—28 to 36 inches; cobbly clay loam

2Ck—36 to 79 inches; clay loam

2Cr—79 to 89 inches; extremely paragravelly cemented

### **Ortiz soils**

*Landscape:* Plateaus (fig. 103 and fig. 104)

*Landform:* Lower eroded fan remnants (fig. 105)

*Position on landform:* Backslopes

*Parent material:* Alluvium derived from granite, gneiss, and schist over residuum weathered from shale

*Slope:* 15 to 40 percent

*Shape (down/across):* Concave/linear

*Surface fragments:* About 30 percent rounded cobbles; about 40 percent rounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 8.4 inches (moderate)

*Shrink-swell potential:* About 6.0 percent (high)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula

*Potential native vegetation:* oneseed juniper, twoneedle pinyon, blue grama, black grama, pricklypear

*Land capability subclass (nonirrigated):* 7s

### **Typical Profile**

A—0 to 2 inches; extremely cobbly loam (fig. 107)

Bt1—2 to 5 inches; clay

Bt2—5 to 10 inches; clay

Bt3—10 to 18 inches; gravelly clay

Btk—18 to 31 inches; gravelly clay loam

Bk—31 to 45 inches; gravelly clay loam

2Ck—45 to 57 inches; extremely paragravelly clay loam

2Cr1—57 to 67 inches; extremely paragravelly cemented silty clay loam

2Cr2—67 to 77 inches; cemented

### **Minor Components Composition**

Cueva and similar soils: About 4 percent

Altega and similar soils: About 3 percent

Predawn and similar soils: About 2 percent

Rock outcrop: About 1 percent



**Figure 103.—An area of Fangio-Ortiz complex, 15 to 50 percent slopes. The soil surface is covered with large numbers of rock fragments.**



**Figure 104.—An area of Fangio-Ortiz complex, 15 to 50 percent slopes. The Ortiz soils are on lower backslopes below the Fangio soils. The Ortiz soils have less rock fragments in the profile and covering the soil surface.**



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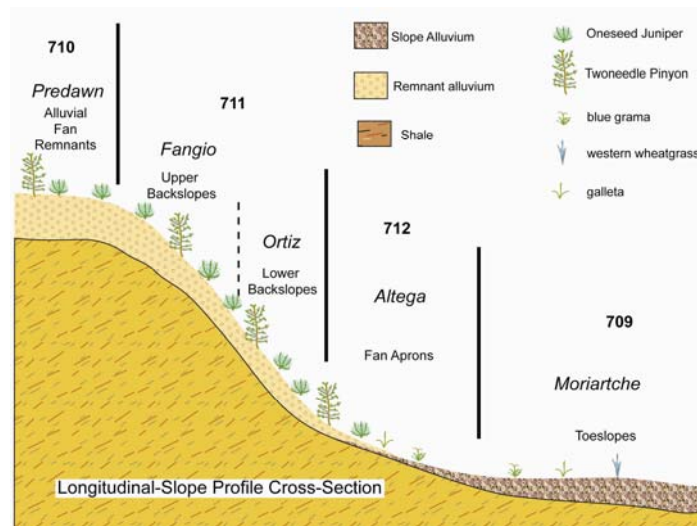


Figure 105.—Cross-section diagram of landform and landform position for map units farther south on Glorieta Mesa.



Figure 106.—Typical profile of the Fangio soil in an area of Fangio-Ortiz complex, 15 to 50 percent slopes. Numerous rock fragments are in the profile. Strong accumulations of calcium carbonate, make the profile very white in color.



**Figure 107.—Typical profile of the Ortiz soil in an area of the Fangio-Ortiz complex, 15 to 50 percent slopes. Note there are far less rock fragments than in the Fangio soil, and calcium carbonate accumulations are much fewer.**

## **712—Altega very fine sandy loam, 3 to 8 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,500 to 7,400 feet (1,981 to 2,256 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Altega and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Altega soils**

*Landscape:* Plateaus (fig. 108)

*Landform:* Fan aprons (fig. 105)

*Parent material:* Slope alluvium derived from mixed sources

*Slope:* 3 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 2 percent rounded (shape or size unspecified)

*Depth class:* Very deep

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 9.6 inches (high)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 4 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm  
(nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0  
(nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua  
curtipendula-Poa fernaldiana

*Potential native vegetation:* twoneedle pinyon, blue grama, oneseed juniper, broom  
snakeweed, western wheatgrass

*Land capability subclass (nonirrigated):* 4c

### ***Typical Profile***

A—0 to 2 inches; loam

AB—2 to 11 inches; loam

Bt—11 to 27 inches; clay loam

Btk1—27 to 50 inches; silt loam

Btk2—50 to 98 inches; loam

### ***Minor Components Composition***

Moriartche and similar soils: About 5 percent

Ortiz and similar soils: About 2 percent

Cueva and similar soils: About 2 percent

Rock outcrop: About 1 percent



**Figure 108.—An area of Altega very fine sandy loam, 3 to 8 percent slopes. The hand dug pit helped to characterize the soil.**

## **713—Lomapedro-Skyute complex, 2 to 10 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 7,200 to 8,500 feet (2,195 to 2,591 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 100 to 120 days

### ***Map Unit Composition***

Lomapedro and similar soils: 60 percent

Skyute and similar soils: 30 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Lomapedro soils**

*Landscape:* Foothills (fig. 109 and fig. 110)

*Landform:* Hills (fig. 99)

*Position on landform:* Shoulders

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 2 to 8 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 17 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 7.6 inches (moderate)

*Shrink-swell potential:* About 6.2 percent (high)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* oneseed juniper, ponderosa pine, Douglas fir, twoneedle pinyon, sedge

*Land capability subclass (nonirrigated):* 3c

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 4 inches; gravelly sandy loam

Bt1—4 to 7 inches; gravelly clay loam

Bt2—7 to 24 inches; clay

Btk—24 to 39 inches; silty clay loam

BCK—39 to 49 inches; extremely paragravelly clay loam

Cr—49 to 59 inches; cemented

**Skyute soils**

*Landscape:* Foothills (fig. 109 and fig. 110)

*Landform:* Hills (fig. 99)

*Position on landform:* Summits

*Parent material:* Residuum weathered from sandstone and shale

*Slope:* 2 to 10 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 5 percent subrounded cobbles; about 15 percent subrounded gravel

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 1.2 inches (very low)

*Shrink-swell potential:* About 2.7 percent (low)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, ponderosa pine, little bluestem, sedge

*Land capability subclass (nonirrigated):* 4s

**Typical Profile**

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 3 inches; gravelly sandy loam

Bt1—3 to 6 inches; sandy loam

Bt2—6 to 9 inches; sandy clay loam

C—9 to 12 inches; gravelly sandy loam

R—12 to 22 inches; bedrock

**Minor Components Composition**

Rock outcrop: About 5 percent

Glorieta and similar soils: About 3 percent

Cueva and similar soils: About 2 percent



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**Figure 109.—An area of Lomapedro-Skyute complex, 2 to 10 percent slopes. This area is characterized by Gambel oak and ponderosa pine.**



**Figure 110.—A variety of tools are used to determine the characteristics of a soil. This is an area of Lomapedro-Skyute complex, 2 to 10 percent slopes.**

## **715—Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 48A

*Elevation:* 7,000 to 8,400 feet (2,134 to 2,560 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 43 to 45 degrees F (6.1 to 7.2 degrees C)

*Frost-free period:* 100 to 120 days

### ***Map Unit Composition***

Lomapedro and similar soils: 90 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Lomapedro soils**

*Landscape:* Foothills (fig. 111)

*Landform:* Hills (fig. 99)

*Position on landform:* Backslopes

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from shale

*Slope:* 25 to 50 percent

*Shape (down/across):* Linear/linear

*Surface fragments:* About 25 percent subrounded gravel

*Depth class:* Deep

*Depth to restrictive feature:* 39 to 59 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 7.5 inches (moderate)

*Shrink-swell potential:* About 7.2 percent (high)

*Runoff class:* Very high

*Calcium carbonate average in horizon of maximum accumulation:* About 5 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-

Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana

*Potential native vegetation:* oneseed juniper, ponderosa pine, Douglas fir, twoneedle pinyon, sedge

*Land capability subclass (nonirrigated):* 6e

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A—1 inch to 4 inches; gravelly sandy clay loam

Bt1—4 to 7 inches; sandy clay loam

Bt2—7 to 18 inches; very gravelly clay

Bt3—18 to 25 inches; clay

Bk—25 to 50 inches; paragravelly clay loam

Cr—50 to 60 inches; cemented



***Minor Components Composition***

Rock outcrop: About 5 percent

Skyute and similar soils: About 2 percent

Cueva and similar soils: About 2 percent

Glorieta and similar soils: About 1 percent



**Figure 111.—An area of Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes.**

## **717—Glorieta-Ribera complex, 1 to 15 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,500 to 7,800 feet (1,981 to 2,377 meters)

*Mean annual precipitation:* 16 to 18 inches (406 to 457 millimeters)

*Mean annual air temperature:* 45 to 47 degrees F (7.2 to 8.3 degrees C)

*Frost-free period:* 110 to 130 days

### ***Map Unit Composition***

Glorieta and similar soils: 55 percent

Ribera and similar soils: 35 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Glorieta soils**

*Landscape:* Foothills (fig. 112 and fig. 113)

*Landform:* Hills, scarps (fig. 102)

*Position on landform:* Foothslopes, toeslopes

*Parent material:* Slope alluvium derived from sandstone and shale

*Slope:* 5 to 15 percent

*Shape (down/across):* Concave/linear

*Depth class:* Very deep

*Depth to restrictive feature:* 79 to 98 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 8.0 inches (moderate)

*Shrink-swell potential:* About 6.8 percent (high)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 11 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 2 mmhos/cm (very slightly saline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (nonsodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass, sideoats grama

*Land capability subclass (nonirrigated):* 3e

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material

A1—1 inch to 3 inches; sandy loam

A2—3 to 6 inches; sandy loam

Bt—6 to 14 inches; clay

Btk1—14 to 30 inches; clay

Btk2—30 to 50 inches; sandy clay

Btk3—50 to 85 inches; coarse sandy loam

Cr—85 to 94 inches; cemented

### **Ribera soils**

*Landscape:* Foothills (fig. 112 and fig. 113)

*Landform:* Structural benches (fig. 102)

*Position on landform:* Summits

*Parent material:* Slope alluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 1 to 8 percent

*Shape (down/across):* Convex/linear

*Surface fragments:* About 1 percent angular gravel

*Depth class:* Moderately deep

*Depth to restrictive feature:* 20 to 39 inches to densic material; 20 to 39 inches to bedrock, paralithic

*Drainage class:* Well drained

*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)

*Available water capacity:* About 3.8 inches (low)

*Shrink-swell potential:* About 5.5 percent (moderate)

*Runoff class:* Low

*Calcium carbonate average in horizon of maximum accumulation:* None

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula

*Potential native vegetation:* Gambel oak, twoneedle pinyon, oneseed juniper, sedge, true mountain mahogany, ponderosa pine

*Land capability subclass (nonirrigated):* 5s

### **Typical Profile**

A1—0 to 1 inch; loamy fine sand

A2—1 inch to 8 inches; fine sandy loam

Bt1—8 to 13 inches; sandy clay loam

Bt2—13 to 23 inches; clay loam

Cd—23 to 26 inches; noncemented material

Cr—26 to 36 inches; cemented material

### **Minor Components Composition**

Cueva and similar soils: About 4 percent

Rock outcrop: About 2 percent

Bernal and similar soils: About 2 percent

Estrada and similar soils: About 2 percent



**Figure 112.—Vegetation is sparse in this area of Glorieta-Ribera complex, 1 to 15 percent slopes.**



**Figure 113.—An area of Glorieta-Ribera complex, 1 to 15 percent slopes.**

## **718—Bernal-Cueva complex, 10 to 50 percent slopes**

### ***Map Unit Setting***

*Major Land Resource Area:* 70A

*Elevation:* 6,100 to 7,900 feet (1,859 to 2,408 meters)

*Mean annual precipitation:* 14 to 16 inches (356 to 406 millimeters)

*Mean annual air temperature:* 46 to 48 degrees F (7.8 to 8.9 degrees C)

*Frost-free period:* 120 to 140 days

### ***Map Unit Composition***

Bernal and similar soils: 50 percent

Cueva and similar soils: 40 percent

Minor components: 10 percent

### ***Component Descriptions***

#### **Bernal soils**

*Landscape:* Foothills (fig. 114)

*Landform:* Hills (fig. 99)

*Position on landform:* Shoulders

*Parent material:* Fine-loamy colluvium derived from sandstone and shale, slope alluvium derived from sandstone and shale over residuum weathered from sandstone

*Slope:* 10 to 25 percent

*Shape (down/across):* Convex/linear

*Depth class:* Shallow

*Depth to restrictive feature:* 10 to 20 inches to bedrock, lithic

*Drainage class:* Well drained

*Slowest permeability:* 0.2 to 0.6 in/hr (moderately slow)

*Available water capacity:* About 2.7 inches (very low)

*Shrink-swell potential:* About 4.5 percent (moderate)

*Runoff class:* High

*Calcium carbonate average in horizon of maximum accumulation:* About 14 percent

*Gypsum average in horizon of maximum accumulation:* None

*Salinity average in horizon of maximum accumulation:* About 0 mmhos/cm (nonsaline)

*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)

*Ecological site:* Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana

*Potential native vegetation:* Gambel oak, twoneedle pinyon, Rocky Mountain juniper, sedge

*Land capability subclass (nonirrigated):* 4s

### ***Typical Profile***

Oi—0 to 1 inch; slightly decomposed plant material (fig. 115)

A—1 inch to 3 inches; loam

Bt1—3 to 12 inches; clay loam

Bt2—12 to 17 inches; clay loam

2R—17 to 27 inches; bedrock

#### **Cueva soils**

*Landscape:* Foothills (fig. 114)

*Landform:* Hills (fig. 99)

*Position on landform:* Backslopes

*Parent material:* Residuum weathered from shale

*Slope:* 20 to 50 percent

*Shape (down/across):* Linear/convex

## Soil Survey of Santa Fe County Area, New Mexico

*Surface fragments:* About 5 percent very angular flagstones; about 15 percent very angular channers  
*Depth class:* Moderately deep  
*Depth to restrictive feature:* 20 to 39 inches to densic material  
*Drainage class:* Well drained  
*Slowest permeability:* 0.0 to 0.001 in/hr (impermeable)  
*Available water capacity:* About 5.9 inches (low)  
*Shrink-swell potential:* About 7.5 percent (high)  
*Runoff class:* Very high  
*Calcium carbonate average in horizon of maximum accumulation:* About 6 percent  
*Gypsum average in horizon of maximum accumulation:* None  
*Salinity average in horizon of maximum accumulation:* About 1 mmhos/cm (nonsaline)  
*Sodium adsorption ratio average in horizon of maximum accumulation:* About 0 (slightly sodic)  
*Ecological site:* *Pinus ponderosa*-*Juniperus scopulorum*/*Quercus gambelii*-*Cercocarpus montanus*/*Poa fendleriana*-*Muhlenbergia montana*  
*Potential native vegetation:* Gambel oak, twoneedle pinyon, Douglas fir, Rocky Mountain juniper, sideoats grama  
*Land capability subclass (nonirrigated):* 5s

### **Typical Profile**

A—0 to 2 inches; channery loam (fig. 116)  
Bt1—2 to 6 inches; clay  
Bt2—6 to 19 inches; clay loam  
Btk—19 to 33 inches; clay loam  
Cd—33 to 43 inches; noncemented material

### **Minor Components Composition**

Badland: About 4 percent  
Rock outcrop: About 3 percent  
Glorieta and similar soils: About 2 percent  
Ribera and similar soils: About 1 percent



Figure 114.—An area of Bernal-Cueva complex, 10 to 50 percent slopes. Common vegetation is the piñon tree and Gambel oak.





**Figure 115.—**Typical profile of the Bernal soil in an area of Bernal-Cueva complex, 10 to 50 percent slopes. This shallow soil has hard sandstone bedrock within 20 inches of the soil surface.



**Figure 116.—**Typical profile of the Cueva soil in an area of Bernal-Cueva complex, 10 to 50 percent slopes. This soil has much more clay than the Bernal component. It is also moderately deep to a soft bedrock contact.

## **W—Water**

### ***Map Unit Setting***

*Major Land Resource Area:* 36

### ***Map Unit Composition***

Water: 100 percent

Minor components: None

### ***Component Descriptions***

#### **Water**

*Landform:* Lakes, rivers

*Ponding hazard:* Frequent

*Seasonal high water table depth:* About 0 to 5 inches



## Use and Management of the Soils

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For general and detailed information regarding the use and management of the soil map units in this survey, see the soil reports and report descriptions available from Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov>. These reports are an inventory and evaluation of the soils in the survey area. The reports can be used to adjust land uses to the limitations and potentials of natural resources and the environment related to rangeland, recreation, wildlife habitat, engineering to include, building site development, sanitary facilities, construction materials, and water management; soil properties that includes engineering index properties, physical properties, chemical properties, soil features, and water features.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information developed during a soil survey can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use a survey to locate sources of sand, gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find a soil survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. Only normal practices for the rated use are considered. Unusual modifications to the site or soil material are not considered in the ratings. Where soils have limitations, engineers and others may be able to modify soil features or adjust the plans for a structure to compensate for most of the limitations. Most of these modifications, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

### Rangeland

Livestock grazing in northern New Mexico has a long tradition, with the Spanish introducing cattle to the area in the 1500's. Historically, grazing was done for subsistence. Today many small operations are run by Hispanic families to whom ranching is a way of life and a much needed form of supplemental income. Many of

these families have been residents since before New Mexico became a territory in 1848. Their livelihood and traditional way of life is being threatened by the rapidly increasing value of real estate in Santa Fe County.

Approximately 59 percent of the land in Santa Fe County is currently rangeland, about 3.5 percent has been subdivided or converted into urban land. As the county has become more developed, there has been an increasing trend toward small acreage horse grazing. This is especially true for the southern part of the county.

Grazing was traditionally sheep and goats with some cattle. Currently, the area is grazed predominantly by cattle. There is still some sheep and goat grazing, horse grazing, and a few people graze alpacas and llamas.

The mountains, foothills, and the shortgrass steppe are the three major areas used for grazing. The mountains and parts of the foothills are primarily grazed in spring and summer while the shortgrass steppe tends to be grazed year round.

Specific Rangeland reports and report descriptions can be found on Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov>.

Range management requires knowledge of the kinds of soil and the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook" which is available on the internet at <http://www.qlti.nrcs.usda.gov> or in local offices of the Natural Resources Conservation Service.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils, vegetation, and water.

Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available on the internet at <http://www.nrcs.usda.gov/technical/efotg> or in local offices of the Natural Resources Conservation Service.

## Forest Management

The general information provided in this section is intended as a guide. It may help resource managers, landowners, and visitors to understand the characteristics and management of forest soils within the survey area. Onsite investigation by resource professionals is needed for the acquisition of site-specific data. Such investigation may result in better solutions to specific resource problems than the general information in the forest management reports and descriptions that are available on the internet at <http://websoilsurvey.nrcs.usda.gov>. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet at <http://soils.usda.gov/technical/nfmanual>.

# Classification of the Soils

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This section describes the system of soil classification. Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, which is typical of the series is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual." (17) Many of the technical terms used in the descriptions are defined in "Soil Taxonomy." (20)

The system of soil classification used by the National Cooperative Soil Survey has six categories. (19, 20) Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are described in the following paragraphs.

**ORDER.** Twelve soil orders are recognized. Five of the orders occur in this survey area. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in "sols". An example is Alfisol. Alfisols, Aridisols, Entisols, Inceptisols, and Mollisols occur in this survey area.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll ("Ust" meaning an ustic moisture regime and "oll" from Mollisol indicating a mollic epipedon high in base saturation.)

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argiustolls ("Argi" meaning presence of an argillic horizon and "ustoll", the suborder of mollisols in an ustic moisture regime.)

**SUBGROUP.** Each great group has a "typic" subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The subgroup "Pachic" identifies the extragrade that indicates an over thickened mollic epipedon.) An example is Pachic Argiustolls

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is Fine-loamy, mixed, superactive, mesic Pachic Argiustolls.

**SERIES.** The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example of a soil series with the taxonomic classification is the Dondiego series.

## Soil Series

The official soil series descriptions, including the range of important characteristics of the soils for the series in this survey area are available on the internet at <http://soils.usda.gov/technical/classification/osd>. Each series listed below has been linked to the official series description.

[Abrojo Series](#)

[Adellern Series](#)

[Adornado Series](#)

[Agua Fria Series](#)

[Alchonzo Series](#)

[Aliante Series](#)

[Alire Series](#)

[Altazano Series](#)

[Altega Series](#)

[Altezita Series](#)

[Andanada Series](#)

[Antonchico Series](#)

[Armenta Series](#)

[Arnor Series](#)

[Arojomil Series](#)

[Asparas Taxadjunct \\*](#)

[Atalaya Series](#)

[Bernal Series](#)

[Bosquecito Series](#)

[Buckhorse Series](#)

[Cabreros Series](#)

[Camelrock Series](#)

[Canuela Series](#)

[Cerrillos Series](#)

[Cerropelon Series](#)

[Chacuaco Series](#)

[Charalito Series](#)

[Chilerojo Series](#)

[Chimayo Series](#)

[Chiminet Series](#)

[Chupadera Series](#)

[Chupe Series](#)

[Churipa Series](#)

[Cielito Series](#)

[Clovis Series](#)

[Cochiti Series](#)

[Condesa Series](#)

[Crucitas Series](#)

[Cueva Series](#)

[Cumacho Series](#)

[Cuyamungue Series](#)

[Davishat Series](#)

[Delvalle Series](#)

[Depolvo Series](#)

[Desario Series](#)

[Devargas Series](#)

[Dondiego Series](#)

[El Rancho Series](#)

[Encantado Series](#)

[Enmedio Series](#)

[Espanola Series](#)

[Espinosa Series](#)

[Esquila Series](#)

[Estrada Series](#)

[Fangio Series](#)

[Fiesta Series](#)

[Frajillo Series](#)

[Glorieta Series](#)

[Golondrina Series](#)

[Hagerman Series](#)

|                          |                             |
|--------------------------|-----------------------------|
| <b>Haozous Series</b>    | <b>Nyjack Series</b>        |
| <b>Harvey Series</b>     | <b>Oelop Series</b>         |
| <b>Herrada Series</b>    | <b>Ohke Series</b>          |
| <b>Horcado Series</b>    | <b>Ojito Series</b>         |
| <b>Horchata Series</b>   | <b>Ortiz Series</b>         |
| <b>Hyer Series</b>       | <b>Palma Series</b>         |
| <b>Ildefonso Series</b>  | <b>Paraje Series</b>        |
| <b>Innacutt Series</b>   | <b>Parida Series</b>        |
| <b>Jaconita Series</b>   | <b>Pastorius Series</b>     |
| <b>Junebee Series</b>    | <b>Pastura Taxadjunct *</b> |
| <b>Kachina Series</b>    | <b>Pedregal Series</b>      |
| <b>Kech Series</b>       | <b>Pegasus Series</b>       |
| <b>Khapo Series</b>      | <b>Penistaja Series</b>     |
| <b>Kinsell Series</b>    | <b>Piojillo Series</b>      |
| <b>Koshare Series</b>    | <b>Portillo Series</b>      |
| <b>Kwahe Series</b>      | <b>Predawn Series</b>       |
| <b>Lamesilla Series</b>  | <b>Puertecito Series</b>    |
| <b>Latierra Series</b>   | <b>Quapaw Series</b>        |
| <b>Lazaro Series</b>     | <b>Quarteles Series</b>     |
| <b>Lazarus Series</b>    | <b>Ranchos Series</b>       |
| <b>Legate Series</b>     | <b>Raydawn Series</b>       |
| <b>Levante Series</b>    | <b>Resolana Series</b>      |
| <b>Lomapedro Series</b>  | <b>Ribera Series</b>        |
| <b>Los Alamos Series</b> | <b>Riovista Series</b>      |
| <b>Manzano Series</b>    | <b>Romberg Series</b>       |
| <b>Margosa Series</b>    | <b>Sabroso Series</b>       |
| <b>Medrano Series</b>    | <b>Sandoval Series</b>      |
| <b>Metate Series</b>     | <b>Santa Fe Series</b>      |
| <b>Mirada Series</b>     | <b>Scogg Series</b>         |
| <b>Morenda Series</b>    | <b>Sedillo Series</b>       |
| <b>Moriartche Series</b> | <b>Sena Series</b>          |
| <b>Musofare Series</b>   | <b>Sipapu Series</b>        |
| <b>Nala Series</b>       | <b>Skyute Series</b>        |
| <b>Navajita Series</b>   | <b>Skyvillage Series</b>    |
| <b>Nazario Series</b>    | <b>Spyglass Series</b>      |
| <b>Netoma Series</b>     | <b>Stanley Series</b>       |

**Sueleros Series**

**Tamarindo Series**

**Tanbark Series**

**Tanoan Series**

**Tapia Series**

**Tetilla Series**

**Totavi Series**

**Travessilla Series**

**Triane Series**

**Truehill Series**

**Tsinat Series**

**Uva Series**

**Verano Series**

**Villario Series**

**Walkibout Series**

**Wandurn Series**

**Witt Series**

**Xenmack Series**

**Yohalem Series**

**Yuzarra Series**

**Zacaton Series**

**Zafarano Series**

**Zarmand Series**

**Zepol Series**

**Zia Series**

**Zozobra Series**

### **Taxadjuncts**

A taxadjunct is a soil (map unit component) that is correlated (named) as a recognized, existing soil series for the purpose of expediency. Taxadjuncts use a soil series name as a reference name but the soils have one or more differentiating characteristics that are outside the taxonomic class limits of the family or higher category for the named soil series. These properties in the aggregate, give responses to use and management similar to those of the named soil series

**Asparas:** This soil is a taxadjunct to the series because it has a fine particle-size class. The taxonomic class is Fine, mixed, superactive, mesic Calcic Argiustolls.

**Pastura:** This soil is a taxadjunct to the series because it has a loamy-skeletal particle-size class. The taxonomic class is Loamy-skeletal, carbonatic, mesic, shallow Calcic Petrocalcids.

# Formation of the Soils

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This section defines soil, describes the factors of soil formation, and relates them to the formation of the soils in the survey area.

## Factors of Soil Formation

Soil is a dynamic medium forming a living shell of varying thickness over the rocky crust of the Earth. Soil, as used in this publication, is a natural body or a collection of natural bodies on the earth's surface, containing living matter and supporting or capable of supporting plant life. Its upper limit is air or shallow water. At its margins it grades to deep water or to barren areas of rock. Soil grades at its lower limit to bedrock or to earthy materials virtually devoid of roots, animals, or marks of other biologic activity. (18,20)

Soil is the result of the interaction of five soil forming factors. (3,13) These factors determine the unique properties and characteristics of a soil at any given location. The five soil forming factors are: (1) the type and mineralogical composition of the *parent material*; (2) the *living organisms* on and in the soil; (3) the *topography* or relief features of a landscape; (4) the different *climates* that the soil has been exposed to; and (5) the length of *time* these development forces have acted upon the soil. The interrelationship of these factors is very complex and it is difficult to isolate the effects of any one factor. The effect of the factors also varies from place to place, but the interaction of the factors ultimately determines the kind of soil that forms. The term "pedogenesis" (soil genesis) is often used to connote the process of soil formation.

## Parent Material

Parent material is the unconsolidated organic and mineral matter in which soil forms. Parent materials influence or wholly determine the color, texture, mineralogy, structure, consistency, reaction, erodibility, and natural fertility of soil.

Most mineral matter is ultimately derived from some type of rock. The survey area has landscapes that in some areas are dominated by exposed bedrock. The vast majority of the bedrock types present in this survey area are igneous rocks and sedimentary rocks. There are some areas in the east central part of the survey area that have appreciable amounts of metamorphic rocks. These rock layers are grouped together into mapable units called formations. Physical and chemical weathering of rocks in these exposed geologic formations, accompanied by natural erosion, provides an abundant source of loose rock debris for the parent materials of soils.

Since the parent materials derived from particular geologic formations have specific characteristics, the soils that form in them tend to also have specific characteristics that are related to or derived from these materials. Certain properties such as mineralogy and soil color are strongly influenced by the initial nature of the parent materials. Such properties are especially evident in dry regions where the rate of chemical alteration of most minerals is slow because of the lack of abundant soil moisture.

The soils in the survey area are formed in several types of parent material. Some soils have formed in only one type of material, while many others have formed in a combination of several types. The parent materials present are alluvium, residuum, colluvium, lacustrine, and eolian material. Each of these materials are discussed in the following paragraphs.

*Alluvium* is sediment that has been moved by running water. It may have been moved many miles or only a few feet. If it has only moved a few feet, we will usually modify the term to *slope alluvium*. In this survey area, it commonly is derived from bedrock such as tuff, sandstone, shale, limestone, or basalt, but it may also be derived from existing soils which are undergoing accelerated erosion.

Common landforms in this survey area where alluvium is a dominant parent material are flood plains, alluvial fans, and stream terraces. The high stream terraces in the northwest part of the survey area are a distinctive feature denoting much older age. The same is true for many of the eroded fan remnants in the central part of the survey area. Some soils, especially in the northern part of the survey area are forming in young, relatively unaltered Holocene alluvium and therefore have minimally developed diagnostic subsurface horizons.

Alluvial deposits are typically stratified because of the fluctuating nature of the processes involving erosion, transportation, and deposition of sediments. This inherent stratification is clearly evident in very young alluvial deposits, but is less evident where pedogenesis has altered or obscured the deposits. Differences in particle or grain sizes because of stratification play an important role in the diagnostic horizons that may form in a soil. For example, calcic horizons in soils commonly form over or within layers having distinct differences in grain size. This effect is because of the change in the size of the pores from one strata or layer to the next, which affects water flow. These different layers slow the movement of soil water and allow compounds such as calcium carbonate held in suspension to be withdrawn into large soil pores where they accumulate over time.

*Residuum* is material formed in place by the physical and chemical weathering of bedrock. Common landform positions in this survey where residuum contributes to the soil material are summits of mesas, plateaus, and structural benches.

*Colluvium* is material that has been moved down steep slopes by mass wasting processes. It is composed of material that has rolled, slid, or fallen down slope because of the influence of gravity. The size fractions of particles in most colluvial deposits are large and the material is unsorted. The rock fragments in colluvium are usually angular, except where the fragments are derived from rock formations or unconsolidated deposits that have preexisting, rounded fragments. Most often, colluvium is an important soil parent material on backslopes.

*Lacustrine* is material that has formed in lake or playa water and exposed when the water level is lowered or the elevation of the land is raised. This occurs mostly in playas in the southeast part of the survey area.

*Eolian material* is sediment that has been transported by wind. Thick eolian deposits are commonly composed of sand and silt sized particles, but may also be composed of aggregated clay-size particles. Eolian materials are sorted through transport where finer materials such as silt and very fine sand may move many miles from the source but coarser materials such as fine or medium sand will be deposited much closer to the source. Calcium carbonate and other chemical compounds such as sodium sulfate are also moved and redeposited by wind in the form of dust. (9,22) Such atmospheric additions of dry clay and fine silt-size particles have a significant cumulative effect over a long period of time, especially on stable landform positions. Labile calcium released by calcareous dust into the soil water may combine with the sulfate anion present in saline soils to form accumulations of secondary gypsum.

## Living Organisms

Plant, animal, and microbial life affect many soil processes such as the physical and chemical weathering of bedrock and parent material, the rates of organic matter decomposition and biochemical transformation, and plant nutrient cycling. Plant roots grow into bedrock and parent material, breaking it loose into individual particles and exert strong pressures to force open joints in rock and unconsolidated materials,



making them more porous. Organic matter is incorporated into the soil solum through root growth and death and also provides an organic mulch at the soil surface by plant litter. In ecosystems with poor soil nutrition or low available moisture, plants can cycle nutrients from great depths or pull water from relatively dry materials in the soil, making them available to other plants and animals.

Animals have an impact on soil formation. Creatures such as ants, earthworms, cicada larvae, mice, moles, prairie dogs, and badgers live and burrow in the soil. Their activities mix layers and concentrate soil particles, while also increasing porosity, permeability, and recycling plant matter and nutrients. Certain soil bacteria participate symbiotically with plants in the basic enzymatic transformations of nitrification, and nitrogen fixation and are responsible for reduction and oxidation processes that induce sulfur oxidation, iron mobilization, and many other biochemical and geochemical transformations in the soil. (5) Actinomycetes are bacteria-like fungi that are of great importance in the decomposition of soil organic matter and are also partly responsible for the aroma of fresh soil. Certain species of fungi may aid or speed the accumulation of calcium carbonate within desert soils. (13)

Field research by ecologists is revealing the importance that algae and spore producing plants play in the health and stability of fragile soils in dry regions. Cryptogamic soil crusts form on and directly under the soil surface when symbiotic communities of algae, fungi, mosses, and lichens flourish. These crusts are characteristically dark and lumpy and can become well developed on sandy, saline, or gypsiferous soils which lack gravel lags or desert pavements. Cryptogamic crusts are important because they provide surface aggregation that stabilizes and protects otherwise sparsely vegetated soils from the hazards of water erosion and soil blowing. (2,6) Other benefits which cryptogam crusts provide is adding organic matter, fixing atmospheric nitrogen, increasing water infiltration, and protecting moisture within the upper inch of soil. (7)

Humans alter the soil by building structures, manipulating rangeland plants for livestock, harvesting or chaining trees, and by leveling, tilling, planting, and irrigating for crop production. All of these activities can cause serious soil erosion and ecosystem degradation if land users are not careful and do not practice good soil conservation techniques.

## **Topography**

Topography has an important influence on soil formation, due both to slope gradient and aspect. Slope gradient determines the rate of surface runoff and the hazard of soil erosion by water as well as the internal drainage of soils. The Quateles soil has a high rate of surface runoff and a severe hazard of water erosion because of steep slopes, resulting in only minimal soil development. By contrast, the well-developed Panky soil has a slow rate of surface runoff and only a slight hazard of water erosion because these soils are on more gentle slopes.

The aspect, or geographic direction a slope faces, can also affect soil formation. In the northern hemisphere, steep north-facing slopes have cooler, more moderate temperatures and more effective soil moisture than steep south-facing slopes.

Topography affects the micro-climatic factors of soils in areas of deeply entrenched canyons. The phenomenon of nighttime cold air drainage into canyons effectively lengthens the frost-free period of soils on adjacent uplands, while shortening the period for the soils on the canyon floors.

## **Climate**

Climate plays an important role in the formation of soils. Climate is a dynamic factor that fluctuates diurnally, monthly and yearly in the mid-latitudes in response to the seasons. It has also undergone significant global changes over the long span of

geologic time. A change in climate alters the balance of other soil forming factors, and soils often display morphologic features that formed under the influence of past climates. Many soils in dry regions which have argillic horizons overlying well developed calcic horizons probably display the effects of former climates. The early Holocene epoch was a time of continent-wide climatic change where increasingly arid conditions, especially in the western parts of the United States, caused additions of calcium carbonate to engulf the argillic horizons of many soils. (9)

A wide range of soil temperature and moisture regimes exist within this survey area. Soil temperature regimes in the survey area range from mesic at low and middle elevations to frigid on the highest elevations. Temperature affects the rate of biological activity, the rate of decomposition of organic matter, and the rate of certain chemical reactions. Within these temperature regimes, rates of many processes can effectively double for every 10 degree C. rise in temperature. (5)

Regional and local weather patterns determine when, what types, and in what amounts precipitation will fall. The survey area has a distinct bi-seasonal pattern of precipitation with significant amounts of moisture coming in winter and summer. Soils at the higher elevations receive much more winter precipitation than those at lower elevations. Moisture coming in the winter in the form of snow and gentle rain avoid high rates of evaporation and can penetrate deeply into soil profiles; consequently, higher elevation soils undergo greater degrees of leaching. Spring months are normally dry and windy with little rainfall. The strong spring winds intensify the dry climate and deplete soil moisture through high evaporation rates. Moisture coming in summer when evapotranspiration rates are high, penetrates to only very shallow depths. Summer moisture typically comes as heavy rainfall from high-intensity thunderstorms of short duration. These summer monsoon storms, occurring between July and September, are isolated in extent and undependable in occurrence. Much of the moisture that falls from such high intensity storms runs off the soil surfaces and is unavailable for plant growth.

Soil moisture affects the types of native vegetation present, the rate of biologic activity, the rate of leaching of chemical compounds, and the degree of illuviation of soil colloids. Within certain limits, increasing amounts of soil moisture will result in greater soil development by increasing the amounts and rates of processes acting upon the soil.

## **Time**

The length of time that parent materials have been exposed to the effects of climate and living organisms is an important factor in soil development. Soil age is the measure of this length of time and is important in identifying soil properties and characteristics. In general, the longer duration of time that a soil has been forming, the stronger degree of expression its diagnostic horizons will have.

The development of carbonate (Bk) horizons of pedogenic origin is a common occurrence in the survey area and is closely related to soil age. (9,22) The formation of Bk horizons can be divided into several identifiable and differentiable stages of maturity of which qualitative and sometimes quantitative age distinctions can be made between soils. This is often a useful and important tool in identifying landform types and positions.

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# Glossary

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Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" which is available on the internet at <http://soils.usda.gov/technical> or in local offices of the Natural Resources Conservation Service.

**ABC soil.** A soil having an A, a B, and a C horizon.

**AC soil.** A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial fan.** A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

**Alluvium.** Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Arroyo.** The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

**Aspect.** The direction toward which a slope faces. Also called slope aspect.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

|                 |              |
|-----------------|--------------|
| Very low.....   | 0 to 3       |
| Low.....        | 3 to 6       |
| Moderate .....  | 6 to 9       |
| High .....      | 9 to 12      |
| Very high ..... | more than 12 |

- Backslope.** The position that forms the steepest and generally linear, middle portion of a hill slope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.
- Backswamp.** A flood plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
- Base slope (geomorphology).** A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).
- Bedding plane.** A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle-size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Bottom land.** An informal term loosely applied to various portions of a flood plain.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Caliche.** A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.
- California bearing ratio (CBR).** The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be

supported by standard crushed limestone, per unit area, with the same degree of distortion.

**Canyon.** A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

**Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Cement rock.** Clayey limestone used in the manufacture of cement.

**Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a chanter.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions.** See Redoximorphic features.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

**COLE (coefficient of linear extensibility).** See Linear extensibility.

**Colluvium.** Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

**Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

**Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are compounds making up concretions. See Redoximorphic features.

**Conglomerate.** A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Corrosion (geomorphology).** A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

**Corrosion (soil survey interpretations).** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Dactite.** A fine-grained extrusive rock with the same general composition as andesite but having less calcic plagioclase and more quartz. (1)

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat poorly drained*, *poorly drained*, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."



**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

**Draw.** A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Earthy fill.** See Mine spoil.

**Ecological site.** An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian deposit.** Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (accelerated).* Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

*Erosion (geologic).* Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

**Erosion pavement.** A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

**Erosion surface.** A land surface shaped by the action of erosion, especially by running water.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

**Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

**Fanglomerate.** A sedimentary rock consisting of waterworn, fragments of various sizes, deposited in an alluvial fan, and later cemented into a firm rock. (1)

- Fan remnant.** A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.
- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.
- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.
- First bottom.** An obsolete, informal term loosely applied to the lowest flood plain steps that are subject to regular flooding.
- Flaggy soil material.** Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** The nearly level plain that borders a stream and is subject to flooding unless protected artificially.
- Flood plain landforms.** A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.
- Flood plain step.** An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.
- Fluvial.** Of or pertaining to rivers or streams; produced by stream or river action.
- Foothills.** A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).
- Footslope.** The concave surface at the base of a hill slope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).
- Forb.** Any herbaceous plant not a grass or a sedge.
- Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** Commonly, a succession of microlows (microbasins) and microhighs (microknolls) in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.
- Gneiss.** A foliated rock formed by regional metamorphism, in which bands or lenticles of granular minerals alternate with bands or lenticles in which minerals having flaky or elongate prismatic habits predominate. (1)

- Granite.** A plutonic rock in which quartz constitutes 10 to 50 percent of the felsic components and in which the alkali feldspars/total feldspars ratio is generally restricted to the range of 65 to 90 percent. (1)
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hard to reclaim** (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
- Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
- Head slope (geomorphology).** A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Hill.** A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.
- Hill slope.** A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:
- A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
- E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.
- B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon*.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*R layer*.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

|                     |                 |
|---------------------|-----------------|
| Less than 0.2 ..... | very low        |
| 0.2 to 0.4 .....    | low             |
| 0.4 to 0.75 .....   | moderately low  |
| 0.75 to 1.25 .....  | moderate        |
| 1.25 to 1.75 .....  | moderately high |
| 1.75 to 2.5 .....   | high            |
| More than 2.5 ..... | very high       |

**Interfluve.** A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

**Interfluve (geomorphology).** A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

**Intermittent stream.** A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

- Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.
- Iron depletions.** See Redoximorphic features.
- Knoll.** A small, low, rounded hill rising above adjacent landforms.
- K-sat.** Saturated hydraulic conductivity. (See Permeability.)
- Lapilli.** Pyroclastic materials that may be either essential, accessory, or accidental in origin, of a size range that has been variously defined within the limits of 2 and 64 mm. The fragments may be either solidified or still viscous when they land; thus, there is no characteristic shape. (1)
- Landslide.** A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.
- Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.
- Latite.** A porphyritic extrusive rock having pheoncrysts of plagioclase and potassium feldspar in nearly equal amounts. (1)
- Leaching.** The removal of soluble material from soil or other material by percolating water.
- Linear extensibility.** Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.
- Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.
- Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.
- Low strength.** The soil is not strong enough to support loads.
- Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
- Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.
- Mass movement.** A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.
- Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. See Redoximorphic features.
- Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.
- Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.
- Mesa.** A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** A kind of map unit that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Monzonite.** A group of plutonic rocks intermediate in composition between syenite and diorite, containing approximately equal amounts of alkali feldspar and plagioclase, little or no quartz and commonly augite as the main mafic mineral. (1)

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size.

Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. See Redoximorphic features.

**Nose slope (geomorphology).** A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

|                      |                       |
|----------------------|-----------------------|
| Very low .....       | less than 0.5 percent |
| Low .....            | 0.5 to 1.0 percent    |
| Moderately low ..... | 1.0 to 2.0 percent    |
| Moderate .....       | 2.0 to 4.0 percent    |
| High .....           | 4.0 to 8.0 percent    |
| Very high .....      | more than 8.0 percent |

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three-dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The movement of water through the soil.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

|                        |                         |
|------------------------|-------------------------|
| Impermeable .....      | less than 000.0015 inch |
| Very slow .....        | 000.0015 to 000.06 inch |
| Slow .....             | 000.06 to 0.2 inch      |
| Moderately slow .....  | 0.2 to 0.6 inch         |
| Moderate .....         | 0.6 inch to 2.0 inches  |
| Moderately rapid ..... | 2.0 to 6.0 inches       |
| Rapid .....            | 6.0 to 20 inches        |
| Very rapid .....       | more than 20 inches     |

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plateau (geomorphology).** A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

**Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Pore linings.** See Redoximorphic features.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Pumice.** Highly vesicular pyroclasts with very low bulk density and thin vesicle walls. (1)

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

|                              |                |
|------------------------------|----------------|
| Ultra acid .....             | less than 3.5  |
| Extremely acid.....          | 3.5 to 4.4     |
| Very strongly acid.....      | 4.5 to 5.0     |
| Strongly acid .....          | 5.1 to 5.5     |
| Moderately acid.....         | 5.6 to 6.0     |
| Slightly acid .....          | 6.1 to 6.5     |
| Neutral .....                | 6.6 to 7.3     |
| Slightly alkaline .....      | 7.4 to 7.8     |
| Moderately alkaline .....    | 7.9 to 8.4     |
| Strongly alkaline .....      | 8.5 to 9.0     |
| Very strongly alkaline ..... | 9.1 and higher |

**Redoximorphic concentrations.** See Redoximorphic features.

**Redoximorphic depletions.** See Redoximorphic features.

**Redoximorphic features.** Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
  - a. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; and
  - b. Masses, which are noncemented concentrations of substances within the soil matrix; and
  - c. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.



2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
  - a. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; and
  - b. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletalans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

**Reduced matrix.** See Redoximorphic features.

**Regolith.** All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

**Relief.** The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

**Rhyolite.** A group of igneous rocks, typically porphyritic and commonly exhibiting flow texture, with phenocrysts of quartz and alkali feldspar in a glassy to cryptocrystalline groundmass. (1)

**Rill.** A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

**Riser.** The vertical or steep side slope (e.g., escarpment) of terraces, flood plain steps, or other stepped landforms; commonly a recurring part of a series of natural, step-like landforms, such as successive stream terraces.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Saturated hydraulic conductivity (K-sat).** See Permeability.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Schist.** A strongly foliated crystalline rock, formed by dynamic metamorphism, that can be readily split into thin flakes or slabs because of the well-developed parallelism of more than 50 percent of the minerals present, particularly those of lamellar or elongate prismatic habit. (1)

**Scoria.** A bomb-size pyroclast that is irregular in formation and generally very vesicular. (1)

**Sedimentary rock.** A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder.** The convex, erosional surface near the top of a hill slope. A shoulder is a transition from summit to backslope.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Side slope (geomorphology).** A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Slickensides (pedogenic).** Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

|                           |                       |
|---------------------------|-----------------------|
| Nearly level .....        | 0 to 1 percent        |
| Very gently sloping ..... | 1 to 3 percent        |
| Gently sloping .....      | 3 to 5 percent        |
| Moderately sloping .....  | 5 to 8 percent        |
| Strongly sloping .....    | 8 to 12 percent       |
| Moderately steep .....    | 12 to 20 percent      |
| Steep .....               | 20 to 45 percent      |
| Very steep .....          | 45 percent and higher |

**Slope alluvium.** Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished

pedes and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

|                |                |
|----------------|----------------|
| Slight .....   | less than 13:1 |
| Moderate ..... | 13-30:1        |
| Strong .....   | more than 30:1 |

**Sodium adsorption ratio (SAR).** A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the  $\text{Ca} + \text{Mg}$  concentration.

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

|                        |                 |
|------------------------|-----------------|
| Very coarse sand ..... | 2.0 to 1.0      |
| Coarse sand .....      | 1.0 to 0.5      |
| Medium sand .....      | 0.5 to 0.25     |
| Fine sand .....        | 0.25 to 0.10    |
| Very fine sand .....   | 0.10 to 0.05    |
| Silt .....             | 0.05 to 0.002   |
| Clay .....             | less than 0.002 |

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Strath terrace.** An extensive remnant of a strath (a flat valley bottom) that belonged to a former erosion cycle before rejuvenation of the stream following uplift, change in base level, or climate change. (1)

**Stream terrace.** One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless soils are either single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Substratum.** See Underlying material.

**Subsurface layer.** Any surface soil horizon (A, E, A2, A3, A4) below the surface layer.

**Summit.** The topographically highest position of a hill slope. It has a nearly level (planar or only slightly convex) surface.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Talus.** Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terrace (geomorphology).** A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope.** The gently inclined surface at the base of a hill slope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hill slope continuum that grades to valley or closed-depression floors.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Toreva block.** A slump block consisting essentially of a single large mass of unjostled material which, during descent, has undergone a backward rotation toward the parent cliff about a horizontal axis that roughly parallels it. (1)

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Tread.** The flat to gently sloping, topmost, laterally extensive slope of terraces, flood plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

**Upland.** An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hill slope continuum.

**Underlying material.** The part of the soil below the solum.

**Valley fill.** The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

**Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Weathering.** All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.



# NRCS Accessibility Statement

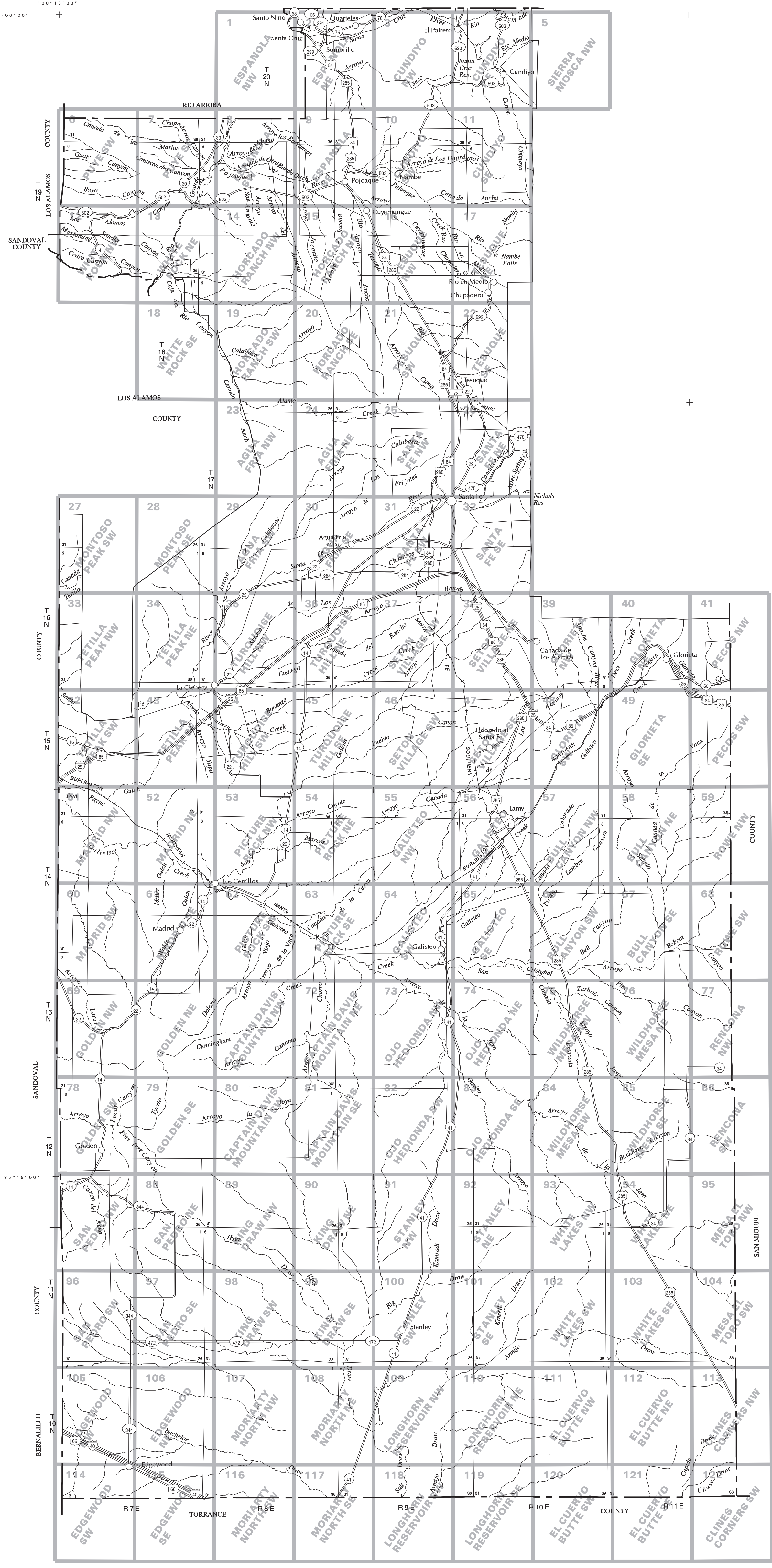
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106°15'00" 36°00'00" COUNTY 105°45'00"



| SECTIONALIZED TOWNSHIP |    |    |    |    |    |
|------------------------|----|----|----|----|----|
| 6                      | 5  | 4  | 3  | 2  | 1  |
| 7                      | 8  | 9  | 10 | 11 | 12 |
| 18                     | 17 | 16 | 15 | 14 | 13 |
| 19                     | 20 | 21 | 22 | 23 | 24 |
| 30                     | 29 | 28 | 27 | 26 | 25 |
| 31                     | 32 | 33 | 34 | 35 | 36 |

**INDEX TO MAP SHEETS**  
**SANTA FE COUNTY AREA, NEW MEXICO**

1 0 1 2 3

MILES

1 0 1 2 3 4 5 6

KILOMETERS

SCALE = 1:175000



SOIL LEGEND

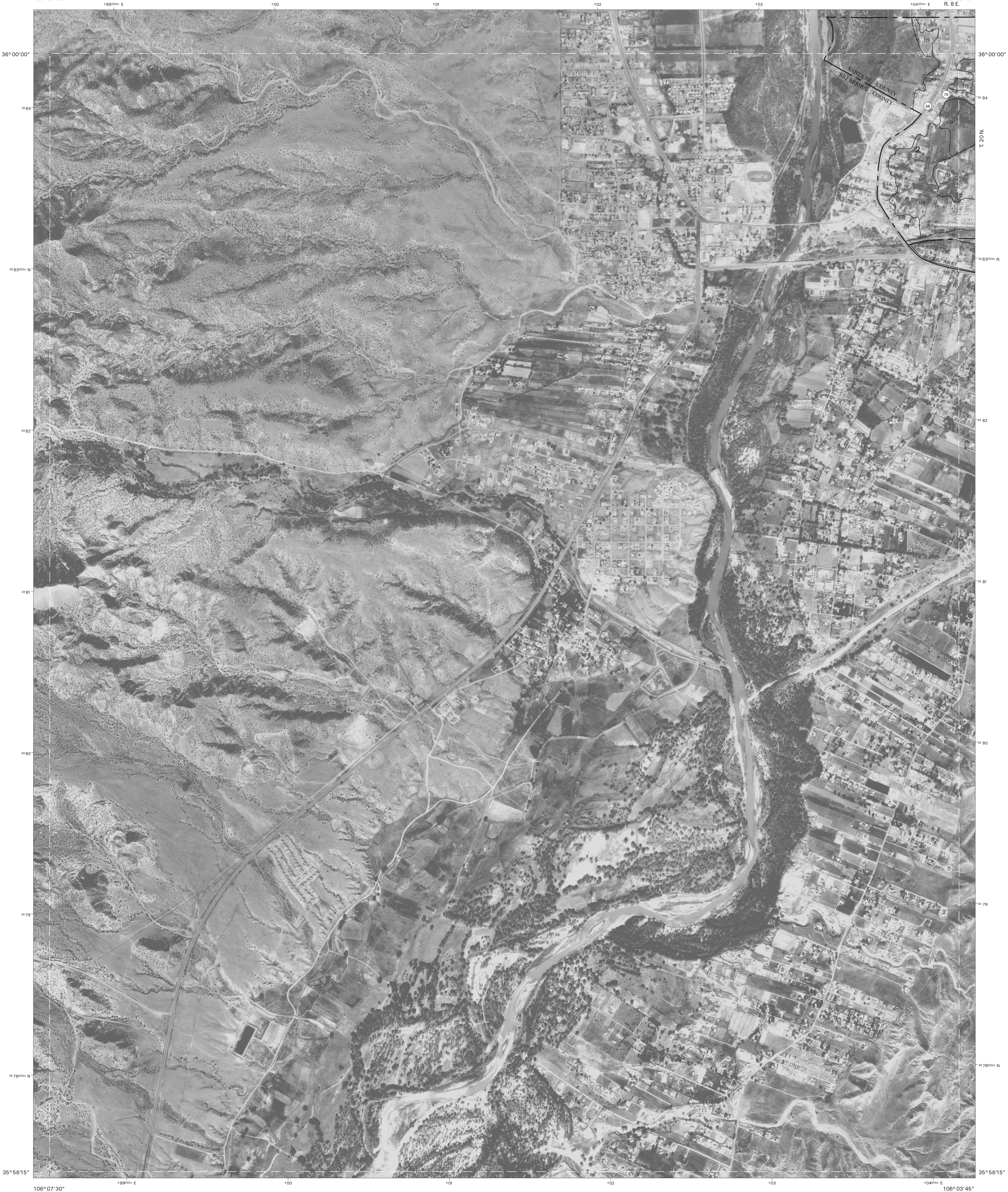
| SYMBOL | NAME                                                                   | SYMBOL | NAME                                                                             |
|--------|------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------|
| 100    | Panky loam, 1 to 4 percent slopes                                      | 214    | Nazario-Urban land complex, 2 to 8 percent slopes                                |
| 101    | Zozobra-Jaconita complex, 5 to 25 percent slopes                       | 215    | Predawn-Urban land complex, 1 to 4 percent slopes                                |
| 102    | Khapo silt loam, 3 to 8 percent slopes                                 | 216    | Dondiego loam, 1 to 3 percent slopes                                             |
| 103    | Zepol silt loam, 0 to 2 percent slopes, flooded                        | 217    | Ohke sandy loam, 1 to 3 percent slopes                                           |
| 104    | Chupe-Riverwash complex, 1 to 3 percent slopes, flooded                | 218    | Pedregal very gravelly loam, 2 to 15 percent slopes                              |
| 105    | Dumps, sanitary landfill                                               | 219    | Ohke sandy loam, 2 to 8 percent slopes                                           |
| 106    | Pits                                                                   | 220    | Horcado-Nazario complex, 2 to 35 percent slopes                                  |
| 107    | Riverwash, flooded                                                     | 221    | Latierra-Lamesilla-Levante complex, 2 to 15 percent slopes, flooded              |
| 108    | Zia fine sandy loam, 0 to 2 percent slopes                             | 222    | Sipapu-Yuzarra-Kachina complex, 5 to 65 percent slopes                           |
| 109    | Tetilla loam, 1 to 5 percent slopes                                    | 223    | Kachina fine sandy loam, 5 to 15 percent slopes                                  |
| 110    | Calabasas loam, 1 to 3 percent slopes                                  | 224    | Portillo extremely gravelly sandy loam, 25 to 50 percent slopes                  |
| 111    | Khapo fine sandy loam, 1 to 3 percent slopes                           | 225    | Encantado-Resolana complex, 35 to 70 percent slopes                              |
| 112    | Riovista gravelly loamy sand, 0 to 1 percent slopes                    | 226    | Crucitas gravelly fine sandy loam, 2 to 10 percent slopes                        |
| 113    | Delvalle-Urban land complex, 0 to 2 percent slopes                     | 300    | Arnor gravelly sandy loam, 2 to 8 percent slopes                                 |
| 114    | Devargas-Urban land complex, 1 to 3 percent slopes                     | 301    | Enmedio-Atalaya-Rock outcrop complex, 5 to 60 percent slopes                     |
| 115    | Panky-Urban land complex, 1 to 4 percent slopes                        | 302    | Setonville-Antonchico complex, 3 to 15 percent slopes                            |
| 116    | Arents-Urban land-Orthents complex, 1 to 60 percent slopes             | 303    | Morenda, Fiesta, and Espanola soils, 1 to 85 percent slopes, flooded             |
| 117    | Agua Fria-Paraje complex, 1 to 8 percent slopes                        | 304    | Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes                           |
| 118    | Golondrina-Paraje complex, 8 to 45 percent slopes                      | 305    | Chimayo-Rock outcrop-Quapaw complex, 50 to 90 percent slopes                     |
| 119    | Vitrina-Haozous complex, 5 to 15 percent slopes, flooded               | 306    | Adellern gravelly sandy loam, 50 to 90 percent slopes                            |
| 120    | Quarteles-Rock outcrop complex, 25 to 90 percent slopes                | 307    | Urban land-Ustorthents-Ustarents complex, 1 to 65 percent slopes                 |
| 121    | El Rancho silt loam, 1 to 3 percent slopes                             | 308    | Enmedio-Zafarano-Rock outcrop complex, 35 to 60 percent slopes                   |
| 122    | Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded           | 309    | Lazaro complex, 5 to 45 percent slopes                                           |
| 123    | Koshare very fine sandy loam, 2 to 8 percent slopes                    | 310    | Santa Fe-Rock outcrop complex, 25 to 45 percent slopes                           |
| 124    | Camelrock silty clay loam, 0 to 2 percent slopes                       | 400    | Chiminet-Canuela-Rock outcrop complex, 2 to 20 percent slopes                    |
| 125    | Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded              | 401    | Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes                    |
| 126    | Walkibout-Innacutt complex, 2 to 80 percent slopes, flooded            | 402    | Navajita complex, 2 to 15 percent slopes                                         |
| 127    | Ojito-Koshare-Quarteles complex, 5 to 50 percent slopes                | 403    | Piojillo paragravelly ashy loamy coarse sand, 3 to 15 percent slopes             |
| 128    | Koshare-Urban land complex, 2 to 8 percent slopes                      | 404    | Totavi ashy loamy coarse sand, 1 to 3 percent slopes                             |
| 129    | El Rancho-Urban land complex, 1 to 3 percent slopes                    | 405    | Espiritu-Pedregal complex, 3 to 50 percent slopes                                |
| 130    | Jaralosa very fine sandy loam, 0 to 2 percent slopes, flooded          | 406    | Rock outcrop-Zacaton-Chiminet complex, 25 to 60 percent slopes                   |
| 131    | Jaconita-Xenmack complex, 25 to 60 percent slopes                      | 407    | Rock outcrop-Chiminet complex, 20 to 50 percent slopes                           |
| 132    | Depolvo-Sueleros complex, 2 to 15 percent slopes                       | 408    | Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes        |
| 133    | Chupe fine sandy loam, 1 to 3 percent slopes                           | 409    | Hackroy-Nyjack complex, 2 to 12 percent slopes                                   |
| 134    | Bosquecito fine sandy loam, 0 to 2 percent slopes, flooded             | 410    | Chiminet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes |
| 135    | Tsinat gravelly loam, 1 to 6 percent slopes                            | 412    | Canuela-Hackroy complex, 1 to 8 percent slopes                                   |
| 136    | Churipa very cobbly sandy loam, 5 to 15 percent slopes                 | 413    | Armenta very paragravelly ashy coarse sand, 3 to 20 percent slopes               |
| 137    | Medrano extremely gravelly loam, 5 to 65 percent slopes                | 414    | Metate loam, 0 to 3 percent slopes                                               |
| 138    | Andanada very gravelly loam, 5 to 15 percent slopes                    | 500    | Sedillo very gravelly loam, 2 to 6 percent slopes                                |
| 139    | Ildefonso-Rock outcrop-Rubble land complex, 30 to 70 percent slopes    | 501    | Truehill extremely gravelly loam, 25 to 55 percent slopes                        |
| 140    | Truehill very cobbly loam, 25 to 45 percent slopes                     | 502    | Khapo fine sandy loam, 1 to 3 percent slopes                                     |
| 141    | Truehill-Penistaja family-Rock outcrop complex, 4 to 50 percent slopes | 503    | Espinosa very gravelly coarse sandy loam, 5 to 40 percent slopes                 |
| 142    | Parida gravelly loam, 3 to 10 percent slopes                           | 504    | Sandoval-Badland complex, 15 to 45 percent slopes                                |
| 143    | Scogg very fine sandy loam, 0 to 2 percent slopes, flooded             | 505    | Puertecito-Paraje complex, 15 to 50 percent slopes                               |
| 144    | Los Alamos fine sandy loam, 1 to 5 percent slopes                      | 506    | Ildefonso-Sandoval complex, 5 to 35 percent slopes                               |
| 145    | Romberg very gravelly sandy loam, 25 to 55 percent slopes              | 507    | Ildefonso extremely gravelly sandy loam, 5 to 15 percent slopes                  |
| 200    | Predawn loam, 1 to 4 percent slopes                                    | 508    | Charalito-Riverwash complex, 1 to 3 percent slopes, flooded                      |
| 201    | Tanoan-Encantado complex, 5 to 25 percent slopes                       | 509    | Puertecito-Wandurn-Rock outcrop complex, 30 to 60 percent slopes                 |
| 202    | Alire loam, 2 to 6 percent slopes                                      | 510    | Cerrillos-Sedillo complex, 1 to 5 percent slopes                                 |
| 203    | Buckhorse-Altazano complex, 2 to 8 percent slopes, flooded             | 511    | Wandurn-Alchonzo-Rubble land complex, 35 to 90 percent slopes                    |
| 204    | Altazano loamy sand, 0 to 2 percent slopes, flooded                    | 512    | Cochiti extremely cobbly loam, 15 to 35 percent slopes                           |
| 205    | Nazario gravelly loam, 2 to 8 percent slopes                           | 513    | Pedregal very cobbly loam, 8 to 15 percent slopes                                |
| 206    | Encantado very cobbly sandy loam, 25 to 45 percent slopes              | 514    | Pegasus extremely cobbly loam, 20 to 50 percent slopes                           |
| 207    | Urban land                                                             | 515    | Pastorius very cobbly loam, 3 to 5 percent slopes                                |
| 208    | Alire-Urban land complex, 2 to 8 percent slopes                        | 516    | Cerrillos fine sandy loam, 1 to 4 percent slopes                                 |
| 209    | Dondiego-Urban land complex, 1 to 3 percent slopes                     | 517    | Puertecito extremely gravelly fine sandy loam, 15 to 25 percent slopes           |
| 210    | Urban land-Buckhorse-Altazano complex, 2 to 8 percent slopes           | 518    | Rock outcrop-Skyvillage complex, 5 to 35 percent slopes                          |
| 211    | Tanoan-Encantado-Urban land complex, 5 to 25 percent slopes            | 519    | Cumacho fine sandy loam, 2 to 8 percent slopes                                   |
| 212    | Junebee gravelly sandy loam, 5 to 15 percent slopes                    | 520    | Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes                           |
| 213    | Levante-Riverwash complex, 1 to 3 percent slopes, flooded              | 521    | Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded              |

| SYMBOL | NAME                                                                      | SYMBOL | NAME                                                                      |
|--------|---------------------------------------------------------------------------|--------|---------------------------------------------------------------------------|
| 522    | Penistaja family fine sandy loam, 1 to 3 percent slopes                   | 522    | Penistaja family fine sandy loam, 1 to 3 percent slopes                   |
| 523    | Kech-Cerropelon-Rock outcrop complex, 5 to 50 percent slopes              | 523    | Kech-Cerropelon-Rock outcrop complex, 5 to 50 percent slopes              |
| 524    | Zia-Gullied land complex, 2 to 10 percent slopes                          | 524    | Zia-Gullied land complex, 2 to 10 percent slopes                          |
| 525    | Hagerman-Cabreros complex, 2 to 6 percent slopes                          | 525    | Hagerman-Cabreros complex, 2 to 6 percent slopes                          |
| 526    | Penistaja family-Truehill complex, 3 to 15 percent slopes                 | 526    | Penistaja family-Truehill complex, 3 to 15 percent slopes                 |
| 527    | Musofare-Asparas complex, 20 to 50 percent slopes                         | 527    | Musofare-Asparas complex, 20 to 50 percent slopes                         |
| 528    | Penistaja family loam, 3 to 8 percent slopes                              | 528    | Penistaja family loam, 3 to 8 percent slopes                              |
| 530    | Jaralosa-Chupe-Riverwash complex, 0 to 1 percent slopes, flooded          | 530    | Jaralosa-Chupe-Riverwash complex, 0 to 1 percent slopes, flooded          |
| 531    | Sena very fine sandy loam, 0 to 2 percent slopes                          | 531    | Sena very fine sandy loam, 0 to 2 percent slopes                          |
| 532    | Galisteo silty clay loam, 0 to 2 percent slopes                           | 532    | Galisteo silty clay loam, 0 to 2 percent slopes                           |
| 534    | Oelop-Charalito complex, 1 to 3 percent slopes                            | 534    | Oelop-Charalito complex, 1 to 3 percent slopes                            |
| 550    | Pits, mine                                                                | 550    | Pits, mine                                                                |
| 600    | Hyer-Witt complex, 1 to 3 percent slopes                                  | 600    | Hyer-Witt complex, 1 to 3 percent slopes                                  |
| 601    | Harvey loam, 3 to 12 percent slopes                                       | 601    | Harvey loam, 3 to 12 percent slopes                                       |
| 602    | Palma fine sandy loam, 3 to 8 percent slopes                              | 602    | Palma fine sandy loam, 3 to 8 percent slopes                              |
| 603    | Lazarus silt loam, 0 to 2 percent slopes, flooded                         | 603    | Lazarus silt loam, 0 to 2 percent slopes, flooded                         |
| 604    | Desario-Espadon complex, 5 to 50 percent slopes                           | 604    | Desario-Espadon complex, 5 to 50 percent slopes                           |
| 605    | Lazarus-Manzano complex, 0 to 8 percent slopes, flooded                   | 605    | Lazarus-Manzano complex, 0 to 8 percent slopes, flooded                   |
| 606    | Pastura-Nala complex, 3 to 15 percent slopes                              | 606    | Pastura-Nala complex, 3 to 15 percent slopes                              |
| 607    | Davishat-Palma complex, 1 to 8 percent slopes                             | 607    | Davishat-Palma complex, 1 to 8 percent slopes                             |
| 608    | Davishat loamy very fine sand, 3 to 8 percent slopes                      | 608    | Davishat loamy very fine sand, 3 to 8 percent slopes                      |
| 610    | Arojomil-Tapia complex, 1 to 5 percent slopes                             | 610    | Arojomil-Tapia complex, 1 to 5 percent slopes                             |
| 611    | Spyglass silt loam, 0 to 2 percent slopes                                 | 611    | Spyglass silt loam, 0 to 2 percent slopes                                 |
| 612    | Trofes loam, 0 to 2 percent slopes                                        | 612    | Trofes loam, 0 to 2 percent slopes                                        |
| 613    | Kinsell silt loam, 0 to 2 percent slopes, flooded                         | 613    | Kinsell silt loam, 0 to 2 percent slopes, flooded                         |
| 614    | Tamarindo loam, 1 to 3 percent slopes                                     | 614    | Tamarindo loam, 1 to 3 percent slopes                                     |
| 615    | Kwahe-Stanley complex, 0 to 1 percent slopes, ponded                      | 615    | Kwahe-Stanley complex, 0 to 1 percent slopes, ponded                      |
| 616    | Triane silty clay loam, 1 to 3 percent slopes                             | 616    | Triane silty clay loam, 1 to 3 percent slopes                             |
| 617    | Ranchos fine sandy loam, 3 to 8 percent slopes                            | 617    | Ranchos fine sandy loam, 3 to 8 percent slopes                            |
| 618    | Davishat-Chupadera complex, 3 to 8 percent slopes                         | 618    | Davishat-Chupadera complex, 3 to 8 percent slopes                         |
| 619    | Villario-Puertecito complex, 25 to 45 percent slopes                      | 619    | Villario-Puertecito complex, 25 to 45 percent slopes                      |
| 621    | Kech-Horchata complex, 1 to 8 percent slopes                              | 621    | Kech-Horchata complex, 1 to 8 percent slopes                              |
| 622    | Arojomil silt loam, 1 to 3 percent slopes                                 | 622    | Arojomil silt loam, 1 to 3 percent slopes                                 |
| 623    | Clovis loam, 3 to 8 percent slopes                                        | 623    | Clovis loam, 3 to 8 percent slopes                                        |
| 624    | Clovis very fine sandy loam, 1 to 3 percent slopes                        | 624    | Clovis very fine sandy loam, 1 to 3 percent slopes                        |
| 625    | Raydawn very cobbly sandy loam, 15 to 35 percent slopes                   | 625    | Raydawn very cobbly sandy loam, 15 to 35 percent slopes                   |
| 626    | Horchata loam, 3 to 8 percent slopes                                      | 626    | Horchata loam, 3 to 8 percent slopes                                      |
| 627    | Palabria-Frajillo complex, 1 to 8 percent slopes                          | 627    | Palabria-Frajillo complex, 1 to 8 percent slopes                          |
| 628    | Nala gravelly sandy loam, 3 to 8 percent slopes                           | 628    | Nala gravelly sandy loam, 3 to 8 percent slopes                           |
| 629    | Frajillo-Chilerojo complex, 5 to 15 percent slopes                        | 629    | Frajillo-Chilerojo complex, 5 to 15 percent slopes                        |
| 630    | Tamarindo loam, 3 to 8 percent slopes                                     | 630    | Tamarindo loam, 3 to 8 percent slopes                                     |
| 632    | Travessilla-Raydawn-Sandoval-Rock outcrop complex, 5 to 45 percent slopes | 632    | Travessilla-Raydawn-Sandoval-Rock outcrop complex, 5 to 45 percent slopes |
| 700    | Aliante-Altega complex, 1 to 10 percent slopes                            | 700    | Aliante-Altega complex, 1 to 10 percent slopes                            |
| 701    | Sabroso-Verano complex, 35 to 65 percent slopes                           | 701    | Sabroso-Verano complex, 35 to 65 percent slopes                           |
| 702    | Estrada-Chacuaco complex, 2 to 8 percent slopes                           | 702    | Estrada-Chacuaco complex, 2 to 8 percent slopes                           |
| 703    | Estrada loam, 2 to 15 percent slopes                                      | 703    | Estrada loam, 2 to 15 percent slopes                                      |
| 704    | Aliante loam, 0 to 3 percent slopes                                       | 704    | Aliante loam, 0 to 3 percent slopes                                       |
| 705    | Margosa-Condesa complex, 2 to 8 percent slopes                            | 705    | Margosa-Condesa complex, 2 to 8 percent slopes                            |
| 706    | Verano-Altezita complex, 45 to 90 percent slopes                          | 706    | Verano-Altezita complex, 45 to 90 percent slopes                          |
| 707    | Altezita-Esquila-Rock outcrop complex, 2 to 10 percent slopes             | 707    | Altezita-Esquila-Rock outcrop complex, 2 to 10 percent slopes             |
| 708    | Urraca-Herrada complex, 3 to 15 percent slopes                            | 708    | Urraca-Herrada complex, 3 to 15 percent slopes                            |
| 709    | Moriartche clay loam, 0 to 3 percent slopes                               | 709    | Moriartche clay loam, 0 to 3 percent slopes                               |
| 710    | Predawn fine sandy loam, 1 to 4 percent slopes                            | 710    | Predawn fine sandy loam, 1 to 4 percent slopes                            |
| 711    | Fangio-Ortiz complex, 15 to 50 percent slopes                             | 711    | Fangio-Ortiz complex, 15 to 50 percent slopes                             |
| 712    | Altega very fine sandy loam, 3 to 8 percent slopes                        | 712    | Altega very fine sandy loam, 3 to 8 percent slopes                        |
| 713    | Lomapedro-Skyute complex, 2 to 10 percent slopes                          | 713    | Lomapedro-Skyute complex, 2 to 10 percent slopes                          |
| 715    | Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes               | 715    | Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes               |
| 717    | Glorieta-Ribera complex, 1 to 15 percent slopes                           | 717    | Glorieta-Ribera complex, 1 to 15 percent slopes                           |
| 718    | Bernal-Cueva complex, 10 to 50 percent slopes                             | 718    | Bernal-Cueva complex, 10 to 50 percent slopes                             |
| W      | Water                                                                     | W      | Water                                                                     |

CONVENTIONAL AND SPECIAL  
SYMBOLS LEGEND

| CULTURAL FEATURES                                           |           |                                               | SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO |
|-------------------------------------------------------------|-----------|-----------------------------------------------|--------------------------------------------|
| BOUNDARIES                                                  |           | MISCELLANEOUS CULTURAL FEATURES               | SOIL DELINEATIONS AND SYMBOLS              |
| National, state, or province                                | -- --     | Farmstead, house                              | ■                                          |
| County or parish                                            | -----     | Church                                        | ✙                                          |
| Minor civil division                                        | - - - - - | School                                        | ✎                                          |
| Reservation (national forest or park, state forest or park) | -----     | Other religion                                | ▲                                          |
| Land grant                                                  | -----     | Located object                                | ○                                          |
| Limit of soil survey (label) and/or denied access area      | -----     | Petroleum                                     | ●                                          |
| Field sheet matchline and neatline                          | -----     | Tank                                          | ●                                          |
| Previously published survey                                 | -----     | Lookout tower                                 | ⚓                                          |
| OTHER BOUNDARY                                              |           | Oil and/or natural gas wells                  | ▲                                          |
| Airport, airfield                                           |           | Windmill                                      | ⚓                                          |
| Cemetery                                                    |           | Lighthouse                                    | ⚓                                          |
| City/county park                                            |           |                                               |                                            |
| STATE COORDINATE TICK                                       | -----     |                                               |                                            |
| 1 890 000 FEET                                              |           |                                               |                                            |
| LAND DIVISION CORNER (section and land grants)              |           |                                               |                                            |
| GEOGRAPHIC COORDINATE TICK                                  |           |                                               |                                            |
| TRANSPORTATION                                              |           | STREAMS                                       |                                            |
| Divided roads                                               | =====     | Perennial stream, double line                 | =====                                      |
| Other roads                                                 | -----     | Perennial stream, single line                 | Label only                                 |
| Trail                                                       | - - - - - | Intermittent stream                           | Label only                                 |
|                                                             |           | Drainage end                                  | Label only                                 |
| ROAD EMBLEMS AND DESIGNATIONS                               |           | DRAINAGE AND IRRIGATION                       |                                            |
| Interstate                                                  |           | Double-line canal                             | =====                                      |
| Federal                                                     |           | Perennial drainage and/or irrigation ditch    | Label only                                 |
| State                                                       |           | Intermittent drainage and/or irrigation ditch | Label only                                 |
| County, farm or ranch                                       |           |                                               |                                            |
| RAILROAD                                                    |           | SMALL LAKES, PONDS, AND RESERVOIRS            |                                            |
| POWER TRANSMISSION LINE                                     |           | Perennial water                               | ●                                          |
| PIPELINE                                                    |           | Miscellaneous water                           | ⊙                                          |
| FENCE                                                       |           | Flood pool line                               |                                            |
| LEVEES                                                      |           | MISCELLANEOUS WATER FEATURES                  |                                            |
| Without road                                                |           | Spring                                        | ~                                          |
| With road                                                   |           | Well, artesian                                | ✦                                          |
| With railroad                                               |           | Well, irrigation                              | ~                                          |
| Single side slope                                           |           |                                               |                                            |
| DAMS                                                        |           |                                               |                                            |
| Medium or small                                             |           |                                               |                                            |
| LANDFORM FEATURES                                           |           |                                               |                                            |
| Prominent hill or peak                                      |           |                                               |                                            |

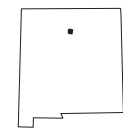




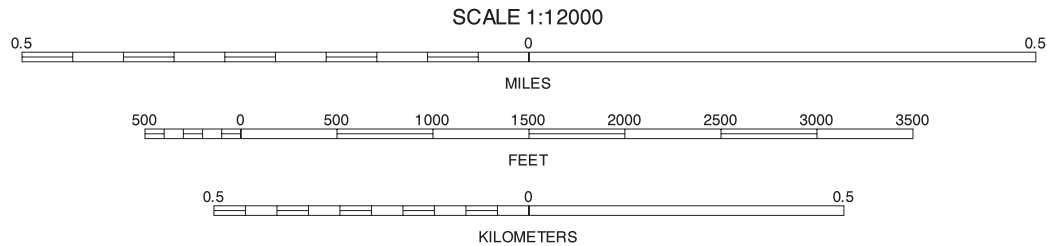
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|   |   |   |
|---|---|---|
|   |   |   |
|   |   | 2 |
| 7 | 8 | 9 |

INDEX TO ADJOINING 3.75 MAPS

2 ESPANOLA NE  
7 PUYE SE  
8 ESPANOLA SW  
9 ESPANOLA SE

ESPANOLA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 1 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 8 Espanola SW

Joins sheet 2 Espanola NE

Joins sheet 7  
Puye SE

Joins sheet 9  
Espanola NE

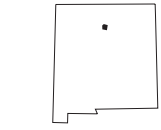




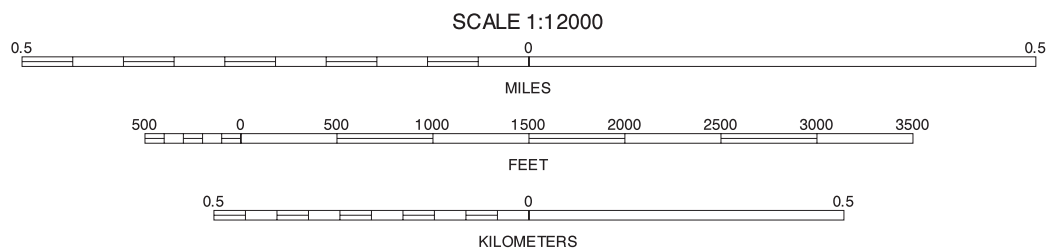
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|   |    |
|---|----|
| 1 | 3  |
| 8 | 10 |

INDEX TO ADJOINING 3.75 MAPS

- 1 ESPANOLA NW
- 3 CUNDIYO NW
- 8 ESPANOLA SW
- 9 ESPANOLA SE
- 10 CUNDIYO SW

ESPANOLA NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 2 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

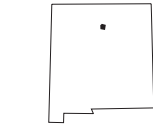




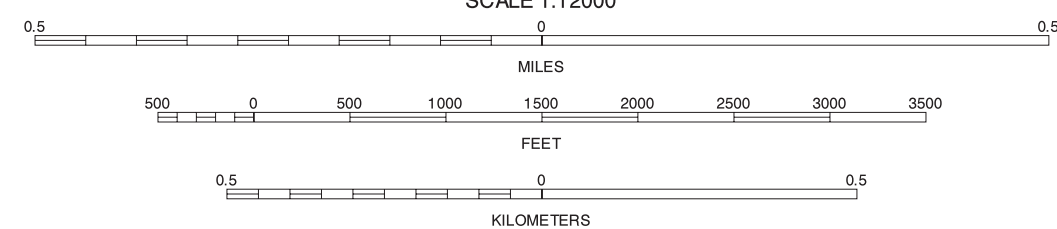
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|   |    |
|---|----|
| 2 | 4  |
| 9 | 11 |

2 ESPANOLA NE  
4 CUNDIYO NE  
9 ESPANOLA SE  
10 CUNDIYO SW  
11 CUNDIYO SE

CUNDIYO NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 3 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



36°00'00"  
39 84  
39 8300m N  
39 82  
39 81  
39 80  
39 79  
39 7800m N  
35°56'15"  
105°56'15"  
416 000m E R. 9.E. R. 10.E.  
417  
418  
419  
420  
421 000m E  
105°52'30"

36°00'00"  
39 84  
39 8300m N  
39 82  
39 81  
39 80  
39 79  
39 7800m N  
35°56'15"  
105°52'30"



Joins sheet 3 Cundiyo NW

Joins sheet 6 Sierra Mosca NW

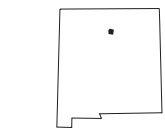
Joins sheet 11 Cundiyo SE

Joins sheet 10 Cundiyo SW

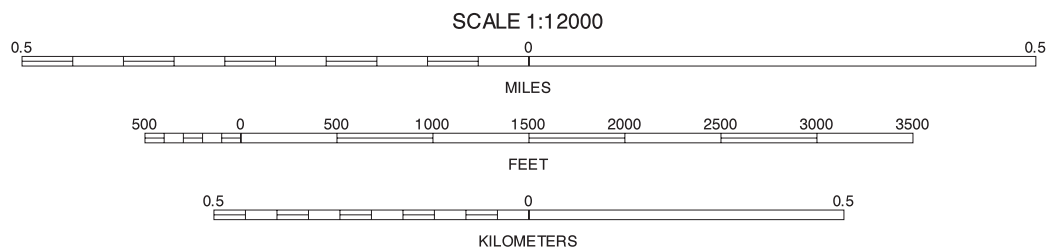
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |   |
|----|----|---|
| 3  |    | 5 |
| 10 | 11 |   |

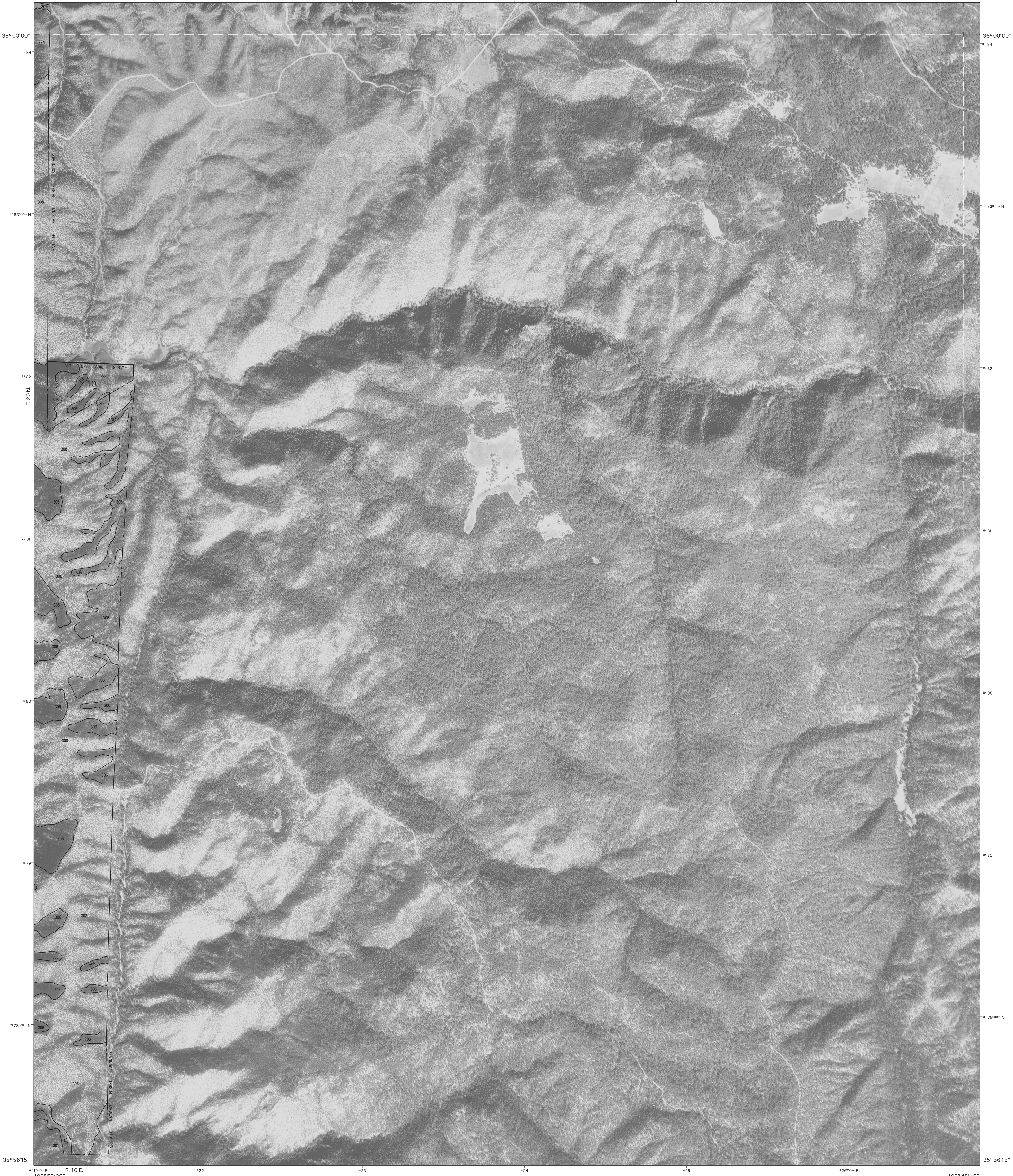
INDEX TO ADJOINING 3.75 MINUTE MAPS

3 CUNDIYO NW  
5 SIERRA MOSCA NW  
10 CUNDIYO SW  
11 CUNDIYO SE

CUNDIYO NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 4 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

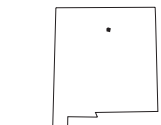




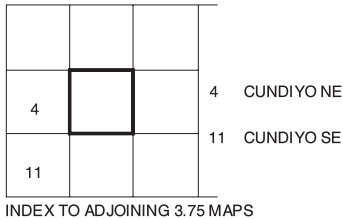
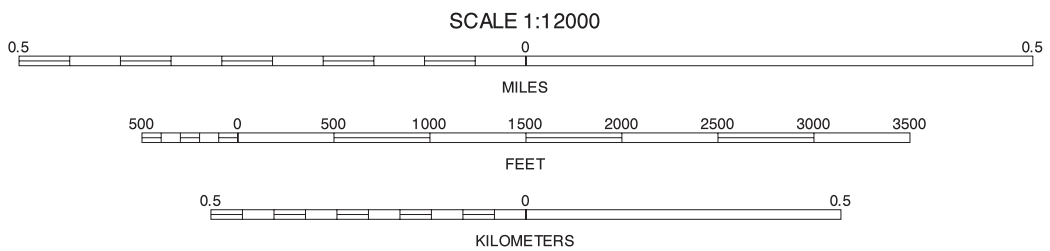
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



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SIERRA MOSCA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 5 OF 122

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

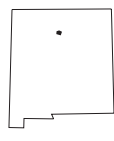




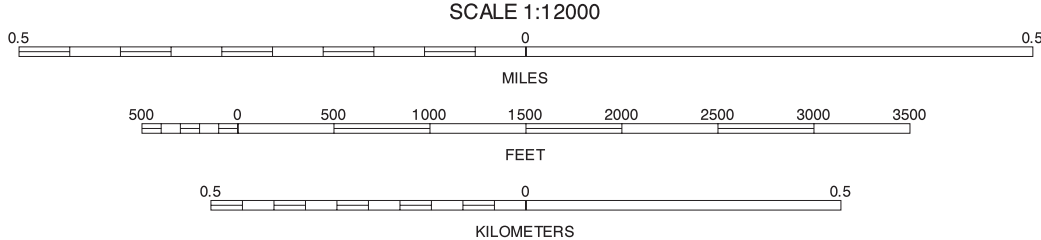
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |  |
|----|----|--|
|    |    |  |
|    | 7  |  |
| 12 | 13 |  |

INDEX TO ADJOINING 3.75 MAPS

PUYE SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 6 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealines are for reference only and are included on adjacent map sheets.

Joins sheet 12 White Rock NW

Joins sheet 13 White Rock NE

Joins sheet 7 Puye SE

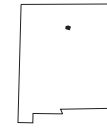




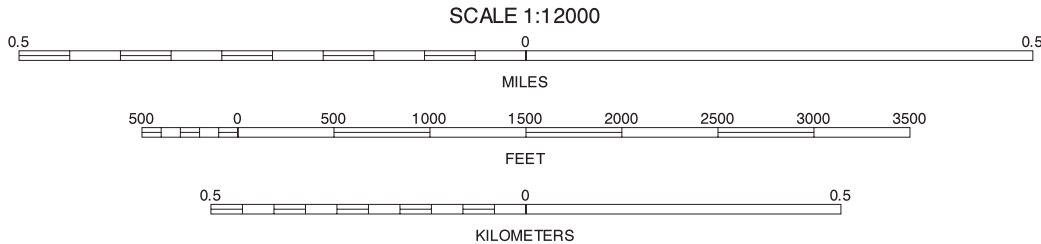
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



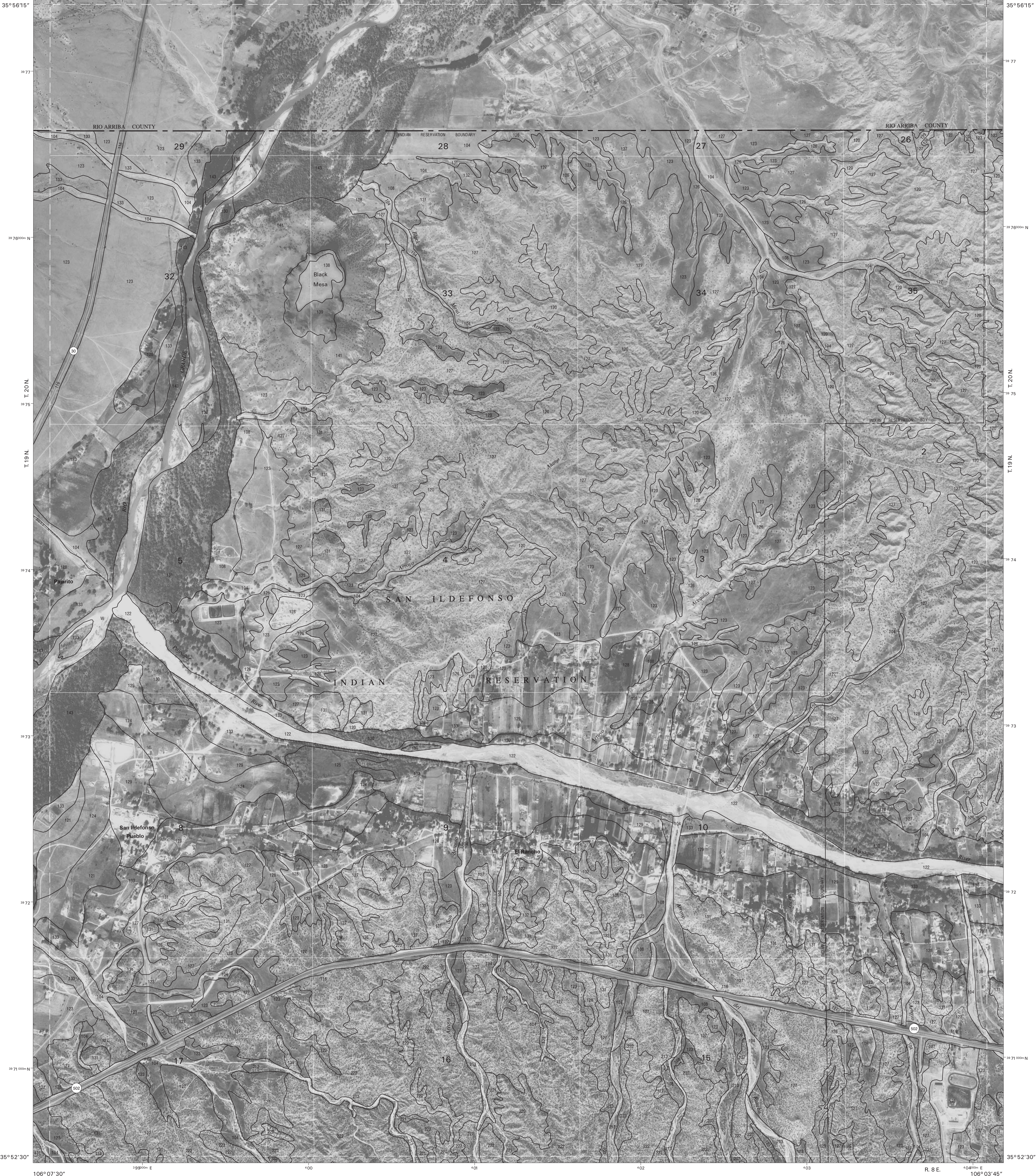
|    |    |    |
|----|----|----|
|    |    | 1  |
| 6  |    | 8  |
| 12 | 13 | 14 |

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PUYE SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 7 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealline are for reference only and are included on adjacent map sheets.

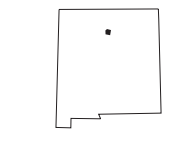




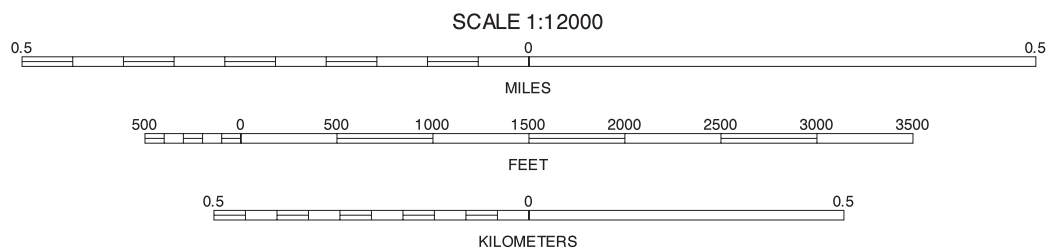
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |
|----|----|
| 1  | 2  |
| 7  | 9  |
| 13 | 15 |

INDEX TO ADJOINING 3.75 MAPS

ESPANOLA SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 8 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 1  
Española NW

Joins sheet 2  
Cundiyo NW

Joins sheet 2 Espanola NE

Joins sheet 15 Horcado Ranch NE

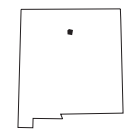
Joins sheet 16  
Tesuque NW



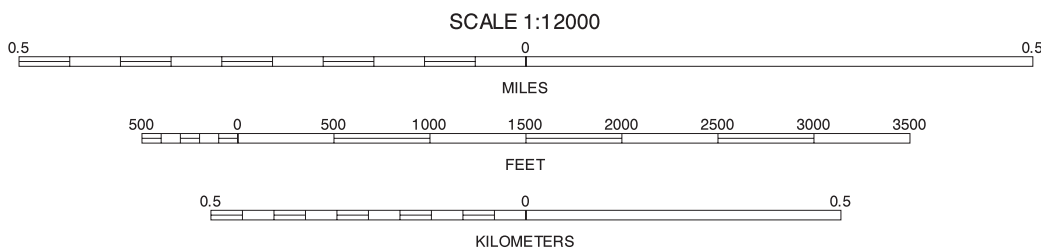
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



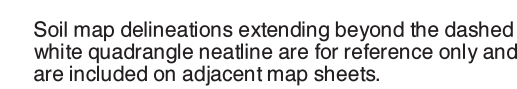
|    |    |    |
|----|----|----|
| 1  | 2  | 3  |
| 8  | 9  | 10 |
| 14 | 15 | 16 |

INDEX TO ADJOINING 3.75 MAPS

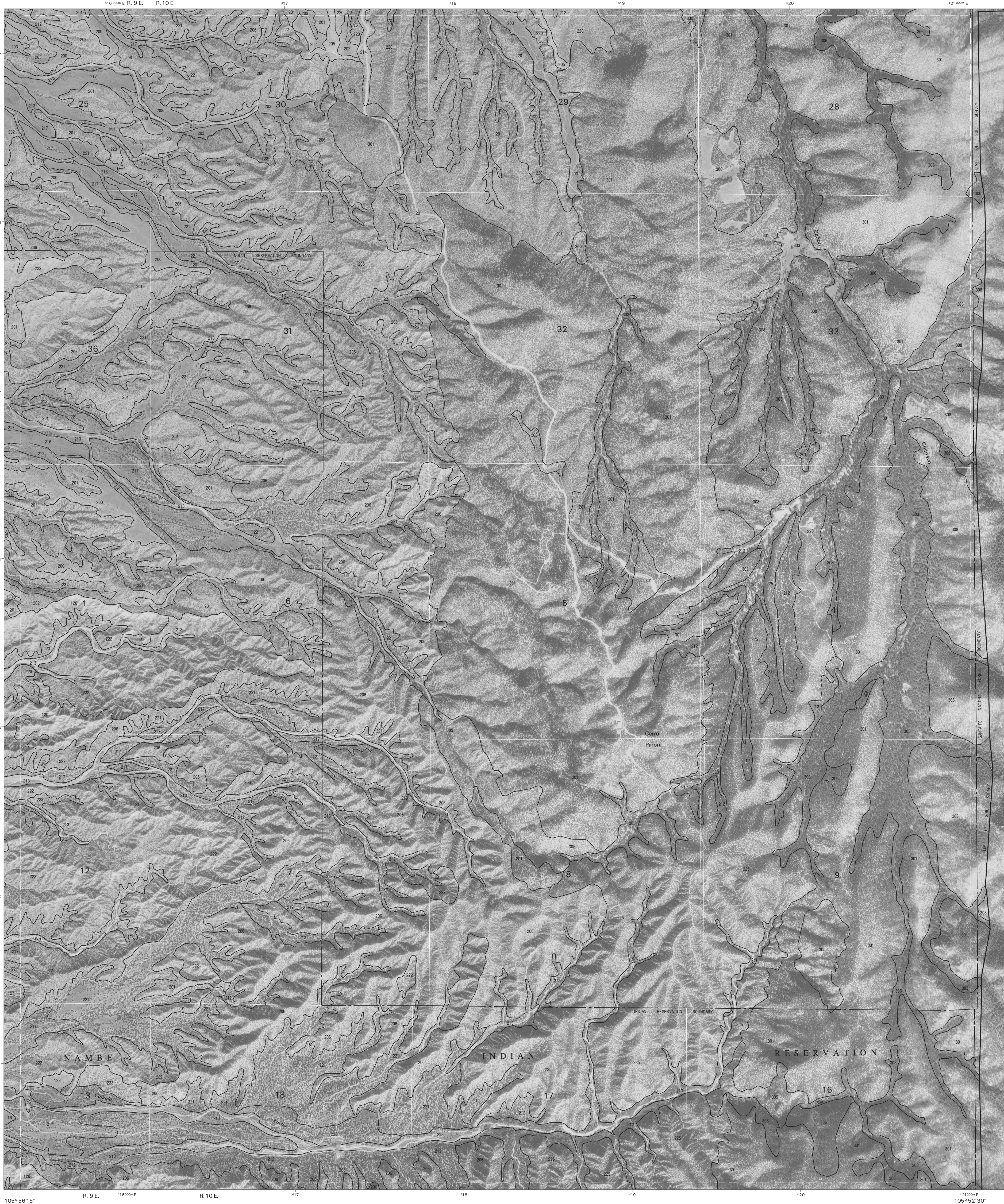
ESPANOLA SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 9 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealline are for reference only and are included on adjacent map sheets.





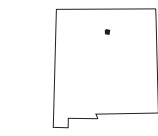




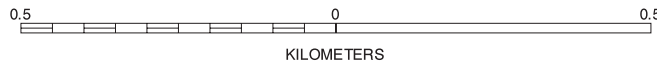
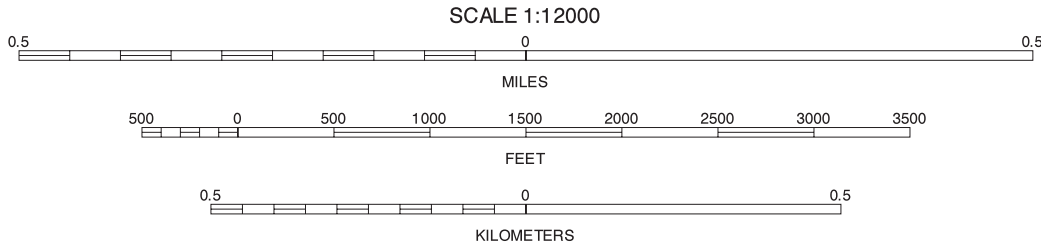
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



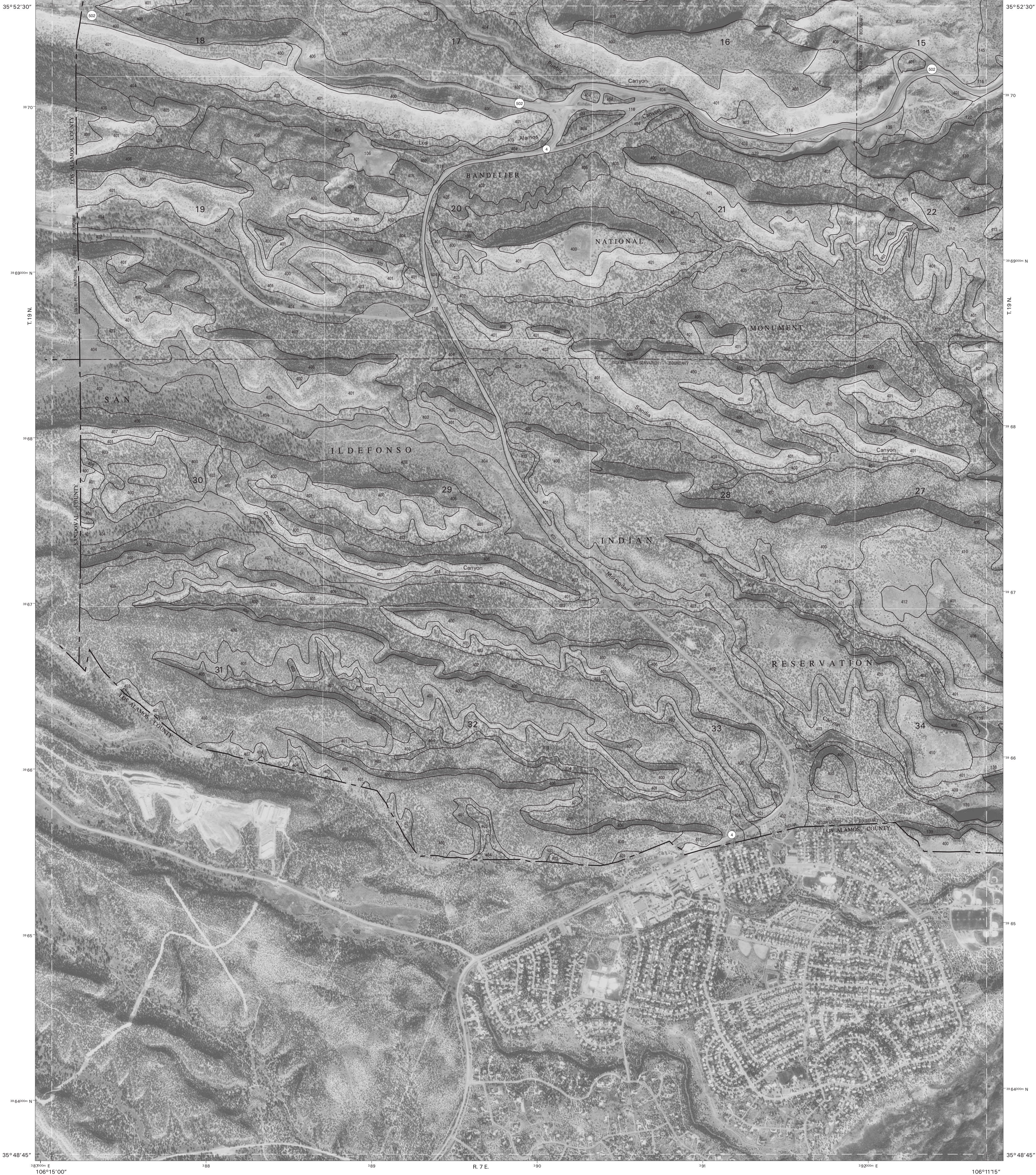
|    |    |   |                   |
|----|----|---|-------------------|
| 3  | 4  | 5 | 3 CUNDIYO NW      |
| 4  |    |   | 4 CUNDIYO NE      |
| 5  |    |   | 5 SIERRA MOSCA NW |
| 10 |    |   | 10 CUNDIYO SW     |
| 16 | 17 |   | 16 TESUQUE NW     |
|    |    |   | 17 TESUQUE NE     |

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CUNDIYO SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 11 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.





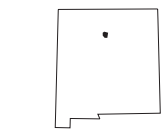
T. 19 N.

Joins sheet 13 White Rock NE

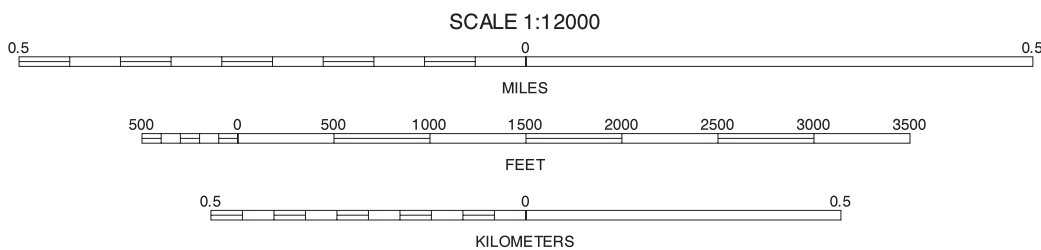
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |                  |
|----|----|------------------|
| 6  | 7  | 6 PUYE SW        |
| 7  | 13 | 13 WHITE ROCK NE |
| 18 | 18 | 18 WHITE ROCK SE |

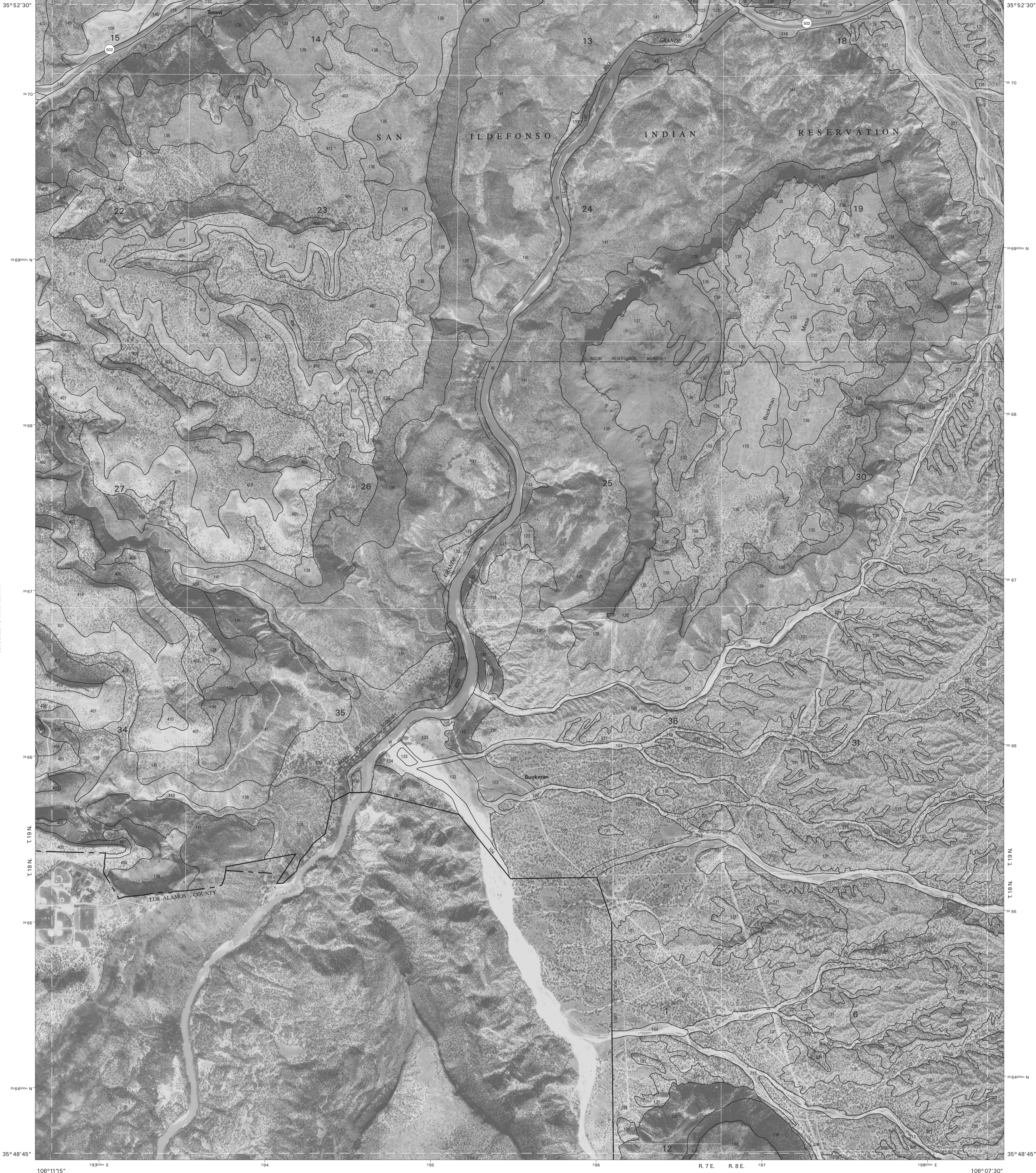
INDEX TO ADJOINING 3.75 MAPS

WHITE ROCK NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 12 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 18  
White Rock SE

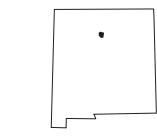




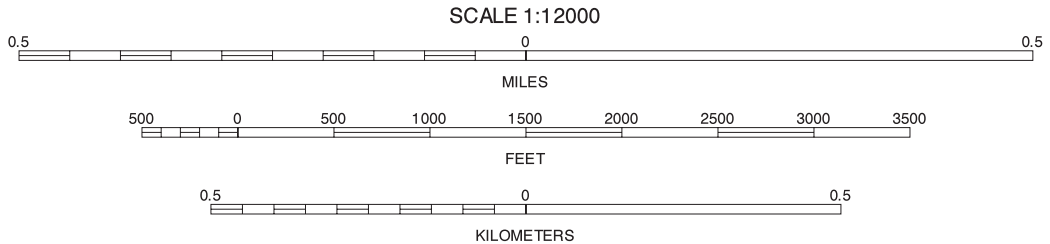
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 6  | 7  | 8  |
| 12 |    | 14 |
|    | 18 | 19 |

INDEX TO ADJOINING 3.75 MAPS

6 PUYE SW  
7 PUYE SE  
8 ESPANOLA SW  
12 WHITE ROCK NW  
14 HORCADO RANCH NW  
18 WHITE ROCK SE  
19 HORCADO RANCH SW

WHITE ROCK NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 13 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.

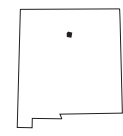




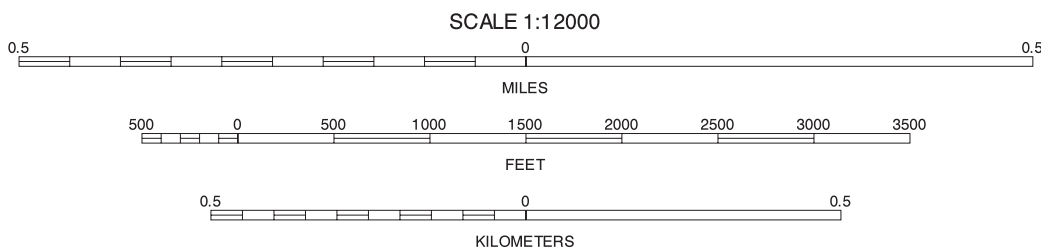
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 7  | 8  | 9  |
| 13 | 14 | 15 |
| 18 | 19 | 20 |

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HORCADO RANCH NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 14 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

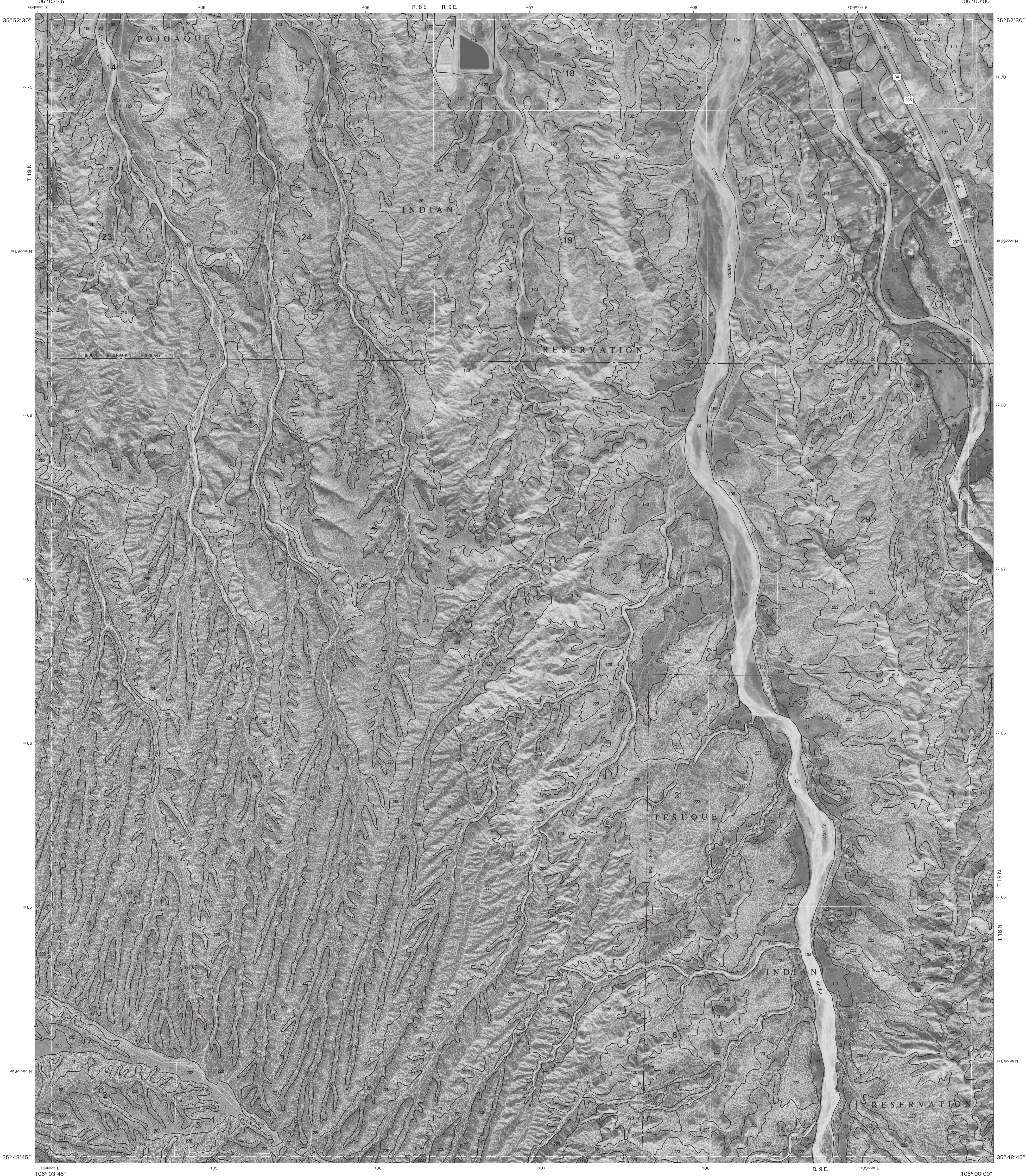


Joins sheet 9  
Española SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

SANTA FE COUNTY AREA, NEW MEXICO  
HORCADO RANCH NE QUADRANGLE  
SHEET NUMBER 15 OF 122

Joins sheet 10  
Cundiyo SW

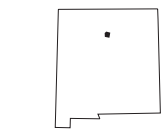


Joins sheet 19  
Horcado Ranch SW

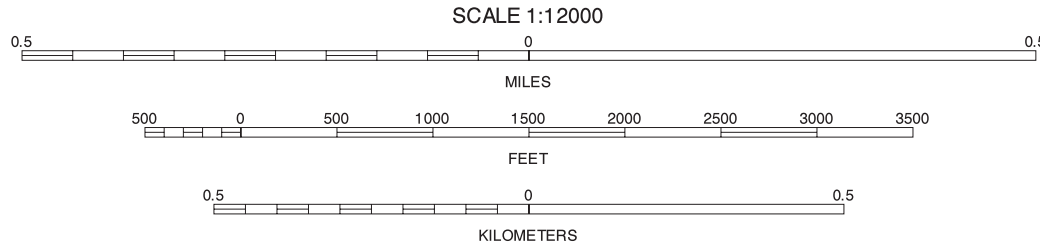
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 8  | 9  | 10 |
| 14 | 15 | 16 |
| 19 | 20 | 21 |

INDEX TO ADJOINING 3.75 MAPS

HORCADO RANCH NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 15 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 21  
Tesuque NW



Joins sheet 9  
Española SE

Joins sheet 11  
Cundiyo SE





Joins sheet 10  
Cundiyo SW

R. 9 E. 416 000m E R. 10 E.

Joins sheet 11 Cundiyo SE

420

421 000m E

35°52'30"

35°52'30"

39 70

39 70

39 69 000m N

39 69 000m N

39 68

39 68

39 67

39 67

39 66

39 66

39 65

39 65

39 64 000m N

39 64 000m N

35°48'45"

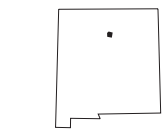
35°48'45"

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

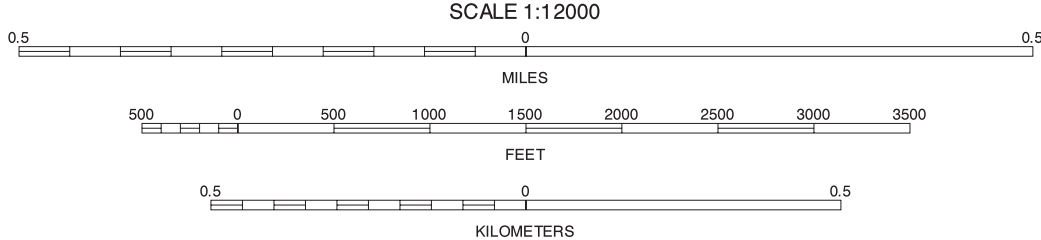
North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

Joins sheet 21  
Tesuque SW

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 22 Tesuque SE

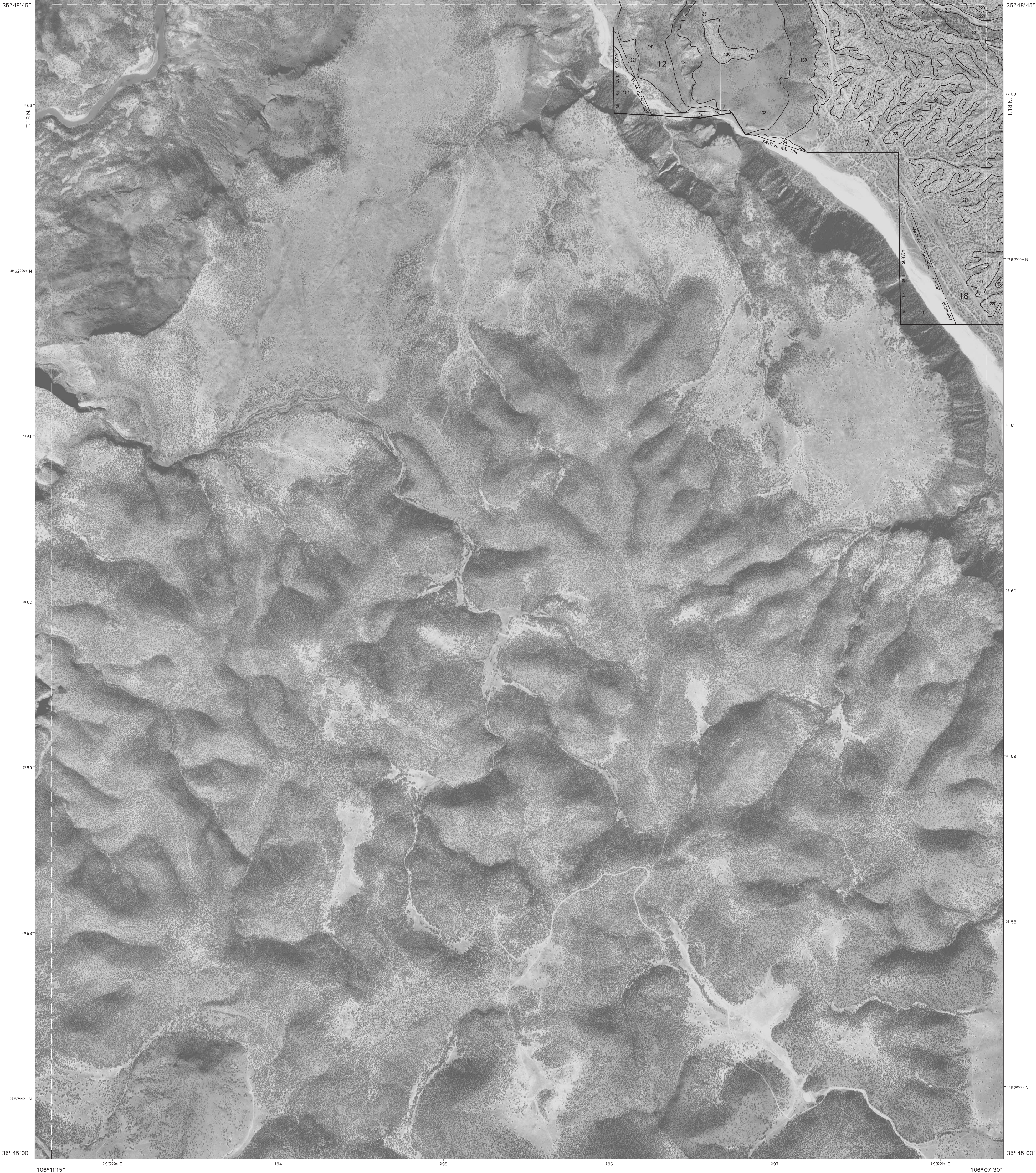
|    |               |               |
|----|---------------|---------------|
| 10 | 11            | 10 CUNDIYO SW |
| 11 | 11 CUNDIYO SE |               |
| 16 | 16 TESUQUE NW |               |
| 21 | 21 TESUQUE SW |               |
| 22 | 22 TESUQUE SE |               |

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TESUQUE NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 17 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

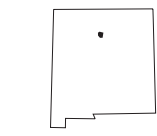




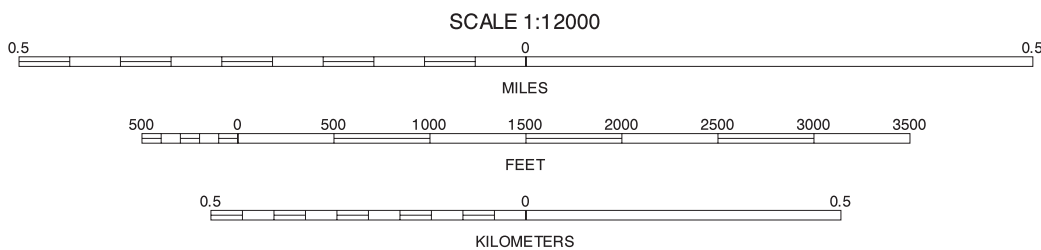
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                     |
|----|----|----|---------------------|
| 12 | 13 | 14 | 12 WHITE ROCK NW    |
|    |    |    | 13 WHITE ROCK NE    |
|    |    |    | 14 HORCADO RANCH NW |
|    |    |    | 19 HORCADO RANCH SW |
|    |    | 23 | 23 AGUA FRIA NW     |

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WHITE ROCK SE, NEW MEXICO  
3.75 MINUTE SERIES  
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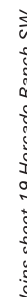
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





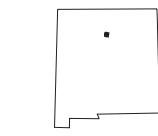
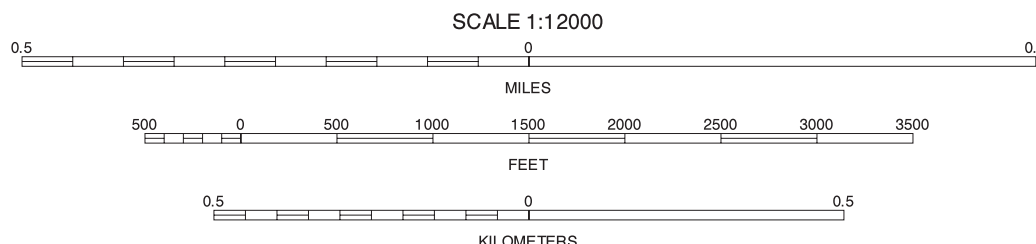


*Joins sheet 24 Agua Fria NE*



Joining about 34 Teachers Circle

Joins sheet 4  
Agua Fria NW

QUARTER QU.  
LOCAT

|    |    |    |                     |
|----|----|----|---------------------|
| 14 | 15 | 16 | 14 HORCADO RANCH NW |
|    |    |    | 15 HORCADO RANCH NE |
| 19 |    | 21 | 16 TESUQUE NW       |
|    |    |    | 19 HORCADO RANCH SW |
| 23 | 24 | 25 | 21 TESUQUE SW       |
|    |    |    | 23 AGUA FRIA NW     |
|    |    |    | 24 AGUA FRIA NE     |
|    |    |    | 25 SANTA FE NW      |

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HORCADO RANCH SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 20 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

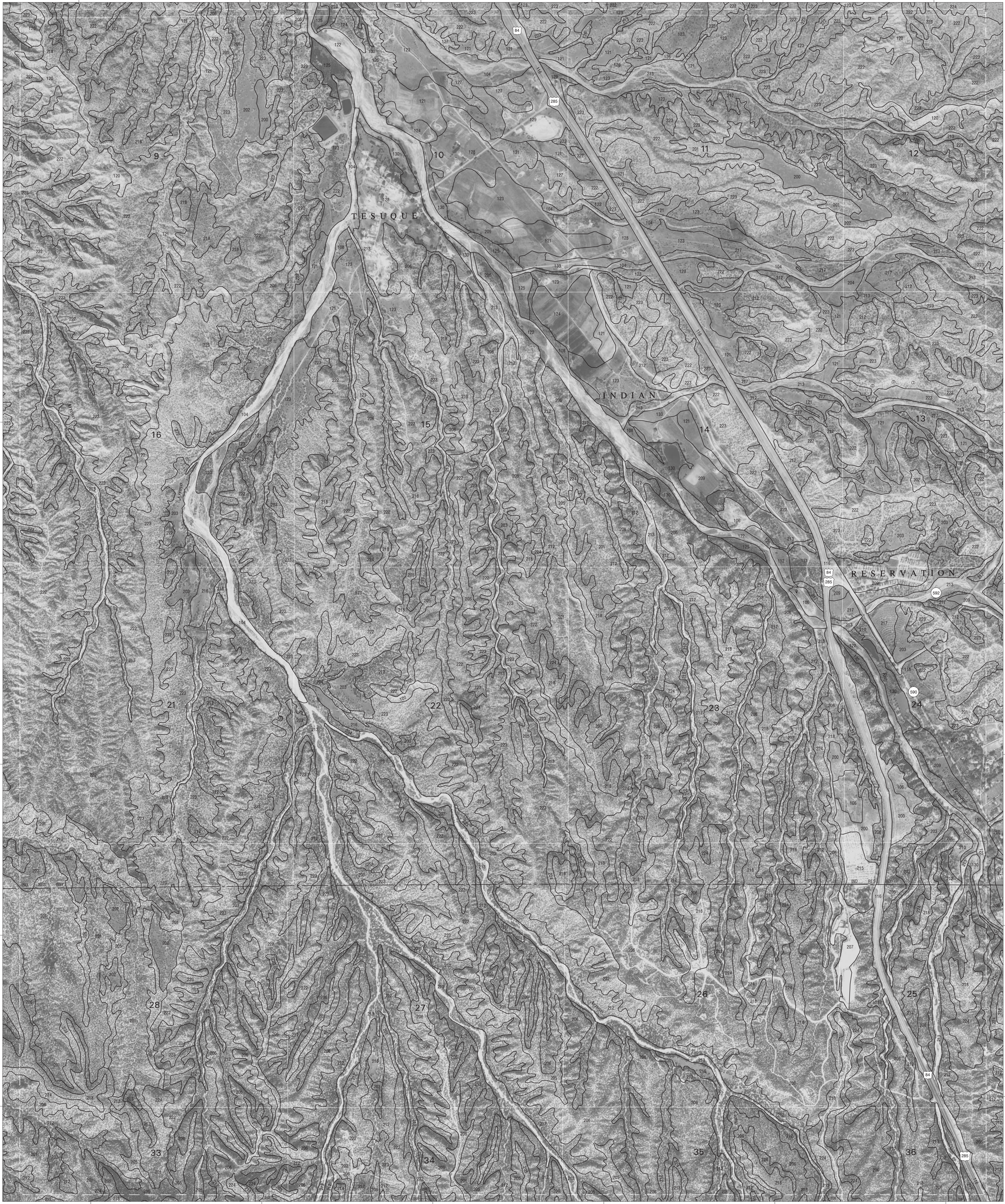


Joins sheet 16 Tesuque NW

R. 9 E.

R. 9 E.

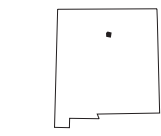
Joins sheet 25 Santa Fe NW



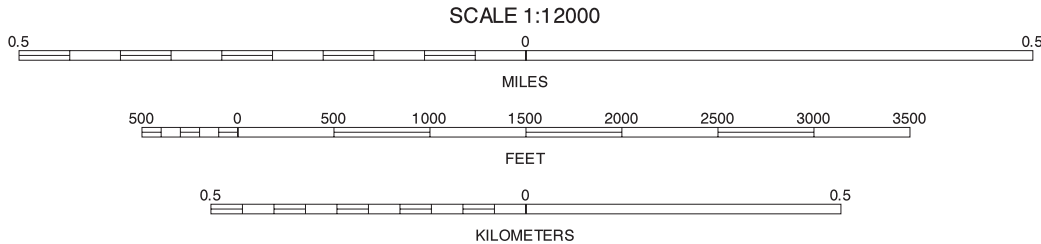
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NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 15 | 16 | 17 |
| 20 | 22 |    |
| 24 | 25 | 26 |

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TESUQUE SW, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

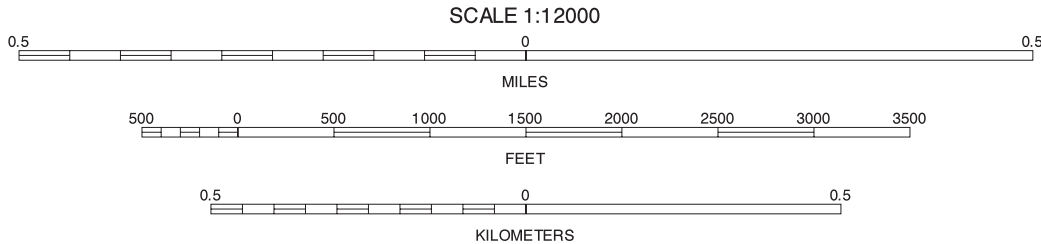
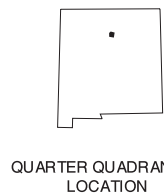




This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

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NORTH



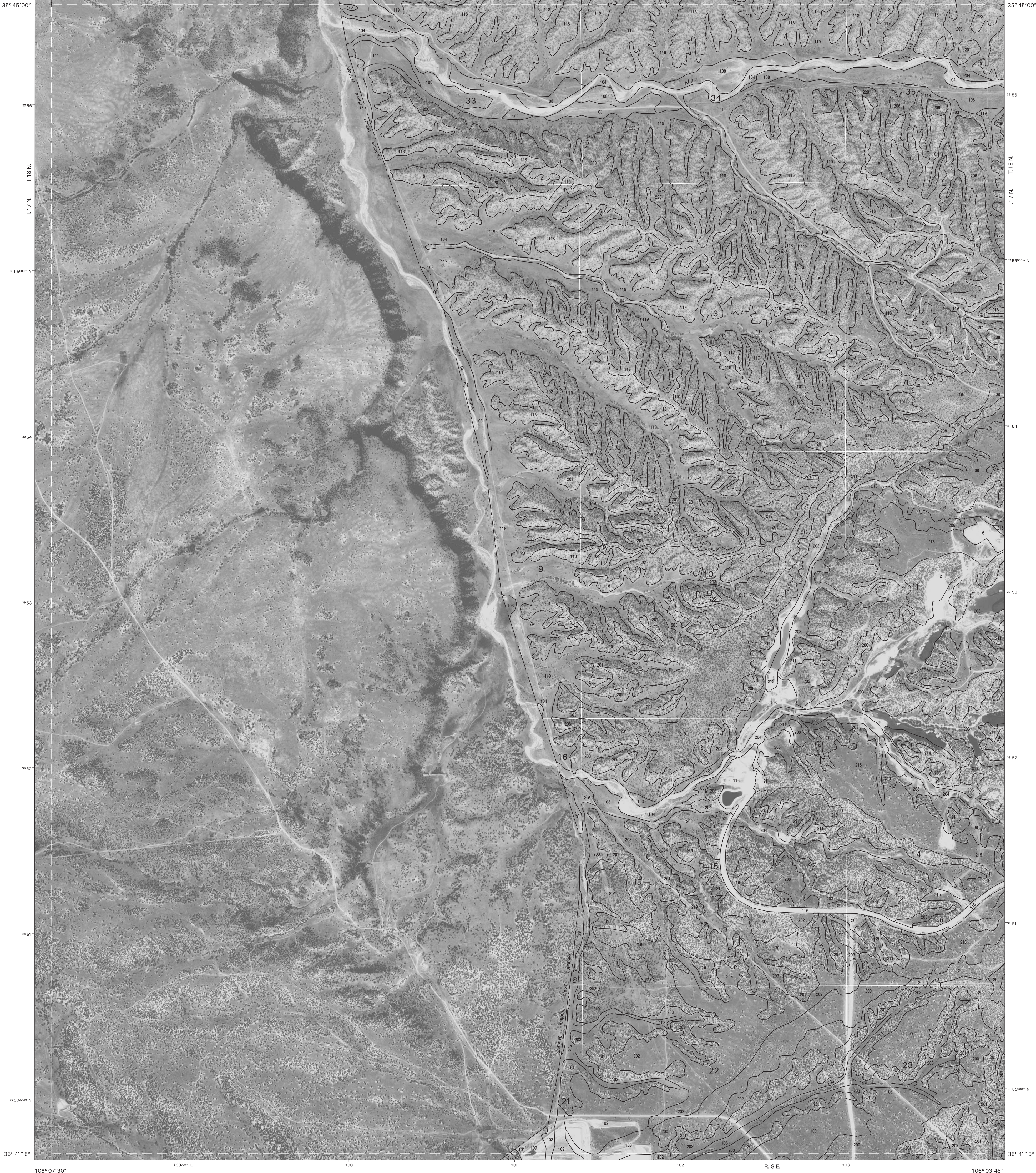
|    |    |  |    |             |
|----|----|--|----|-------------|
| 16 | 17 |  | 16 | TESUQUE NW  |
|    |    |  | 17 | TESUQUE NE  |
| 21 |    |  | 21 | TESUQUE SW  |
|    |    |  | 25 | SANTA FE NW |
| 25 | 26 |  | 26 | SANTA FE NE |

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TESUQUE SE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

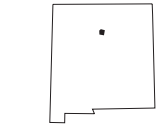




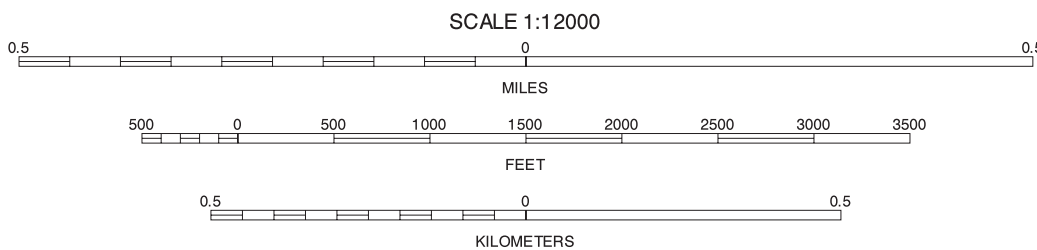
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 18 | 19 | 20 |
|    | 24 |    |
| 28 | 29 | 30 |

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20 HORCADO RANCH SE  
24 AGUA FRIA NE  
28 MONTOSO PEAK SE  
29 AGUA FRIA SW  
30 AGUA FRIA SE

AGUA FRIA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 23 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.



Joins sheet 19  
Horseshoe Ranch SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 20 Horsado Ranch SE

SANTA FE COUNTY AREA, NEW MEXICO  
AGUA FRIA NE QUADRANGLE  
SHEET NUMBER 24 OF 122

Joins sheet 21  
Yosemite SW



Joins sheet 23 Agua Fria NW

Joins sheet 25 Santa Fe NW

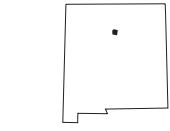
Joins sheet 29  
Agua Fria SW

Joins sheet 31  
Santa Fe SW

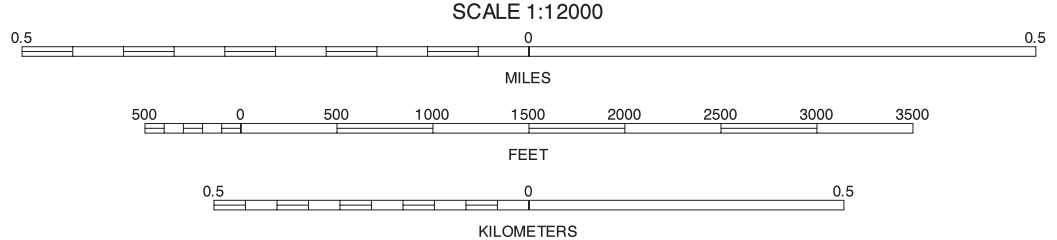
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 19 | 20 | 21 |
| 23 | 24 | 25 |
| 29 | 30 | 31 |

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- 20 HORCADO RANCH SE
- 21 TESUQUE SW
- 23 AGUA FRIA NW
- 25 SANTA FE NW
- 29 AGUA FRIA SW
- 30 AGUA FRIA SE
- 31 SANTA FE SW

AGUA FRIA NE, NEW MEXICO  
3.75 MINUTE SERIES  
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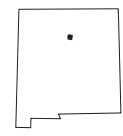
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



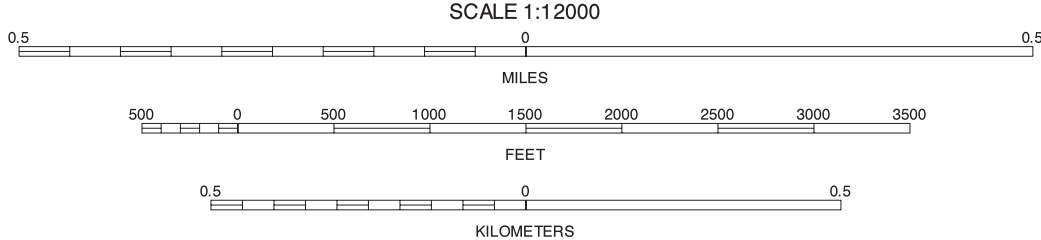
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                     |
|----|----|----|---------------------|
| 20 | 21 | 22 | 20 HORCADO RANCH SE |
|    |    |    | 21 TESUQUE SW       |
|    |    |    | 22 TESUQUE SE       |
| 24 |    | 26 | 24 AGUA FRIA NE     |
|    |    |    | 26 SANTA FE NE      |
|    |    |    | 30 AGUA FRIA SE     |
| 30 | 31 | 32 | 31 SANTA FE SW      |
|    |    |    | 32 SANTA FE SE      |

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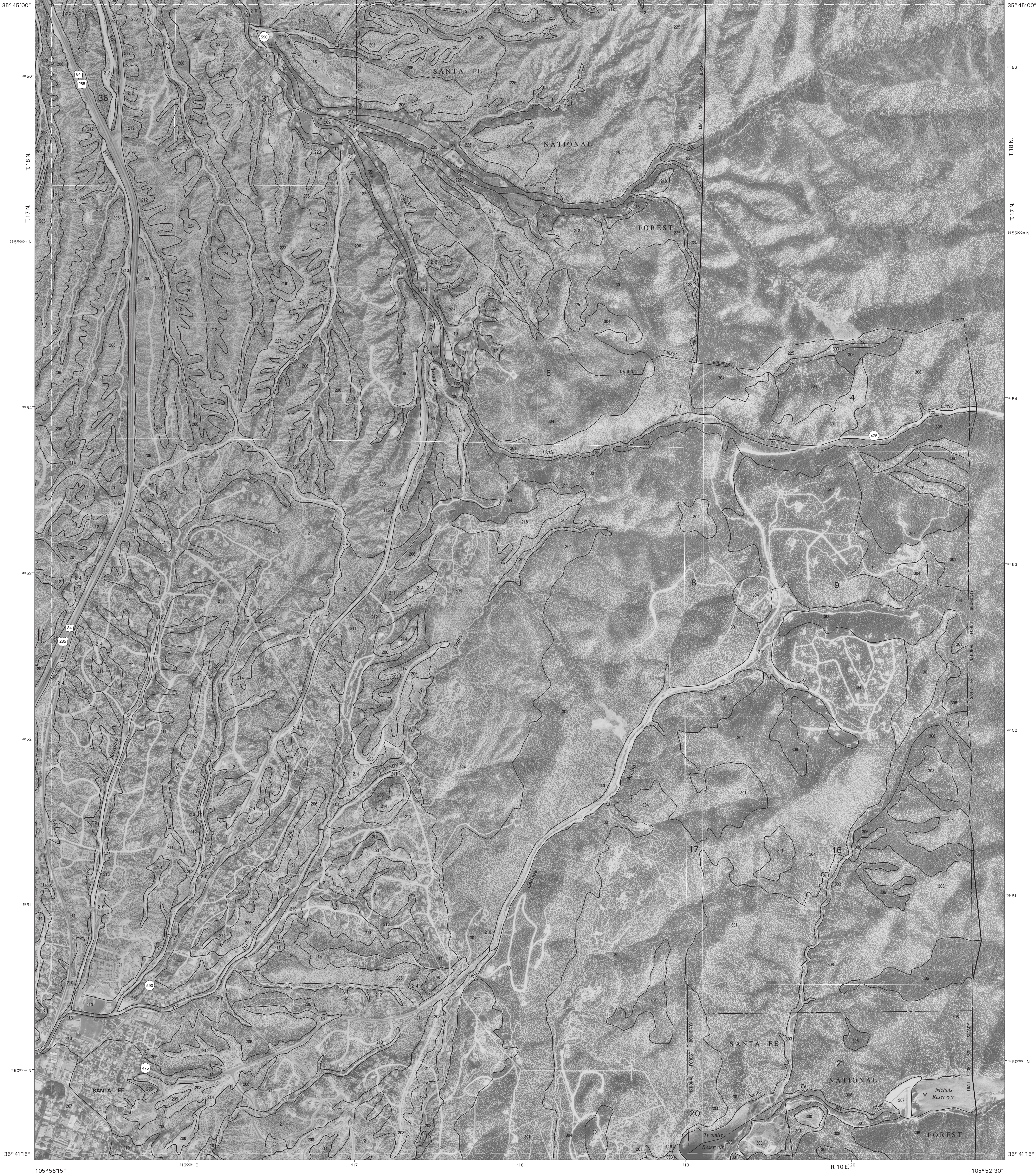
SANTA FE NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 25 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



R. 9 E. 416 000m E R. 10 E.

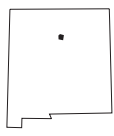
Joins sheet 22 Tesuque SE



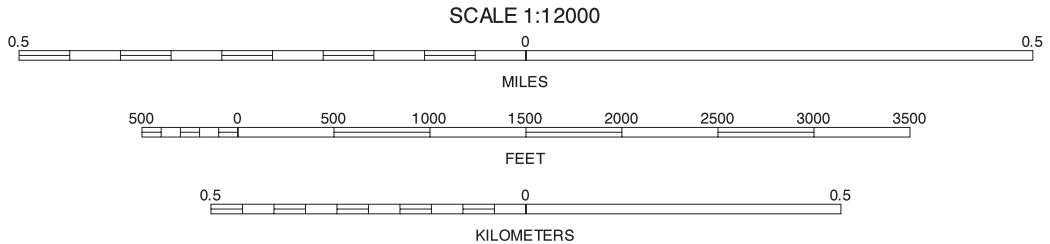
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 32 Santa Fe SE

|    |    |  |    |             |
|----|----|--|----|-------------|
| 21 | 22 |  | 21 | TESUQUE SW  |
|    |    |  | 22 | TESUQUE SE  |
| 25 |    |  | 25 | SANTA FE NW |
|    |    |  | 31 | SANTA FE SW |
| 31 | 32 |  | 32 | SANTA FE SE |

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SANTA FE NE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





North American Datum of 1983(NAD83). GRS80 Spheroid  
1000-meter ticks: Universal Transverse Mercator, zone 13.  
Coordinate grid ticks and land division data, if shown, are  
approximately positioned. Digital data are available for  
this quadrangle.

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





Joins sheet 27 Montoso Peak SW

Joins sheet 25 Agua Fria SW

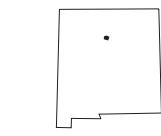
Joins sheet 25  
Turquoise Hill NW

Joins sheet 35  
Turquoise Hill NW

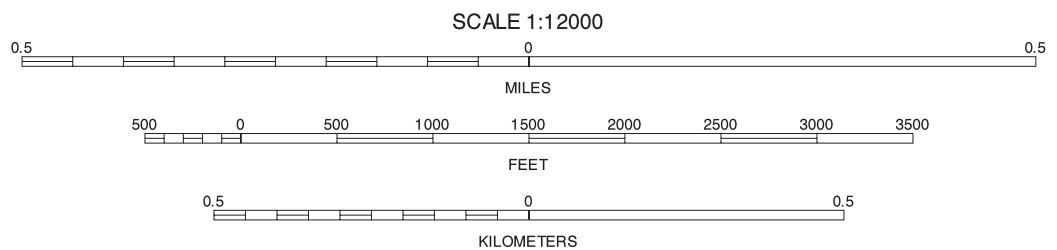
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
|    |    | 23 |
| 27 |    | 29 |
| 33 | 34 | 35 |

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MONTOSO PEAK SE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.



Joins sheet 23 Agua Fria NW

Joins sheet 24  
Agua Fria NE



Joins sheet 28 Montoso Peak SE

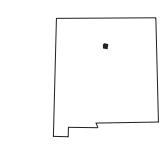
Joins sheet 30 Agua Fria SE

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

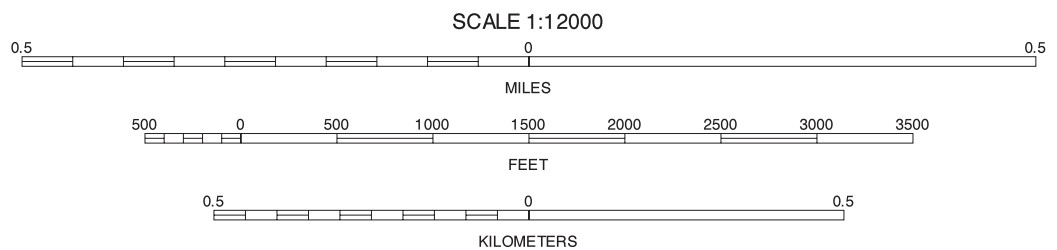
North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

Joins sheet 24  
Turquoise Hill NE

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 35 Turquoise Hill NW

Joins sheet 36  
Turquoise Hill SE

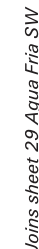
|    |    |    |    |                   |
|----|----|----|----|-------------------|
|    | 23 | 24 | 23 | AGUA FRIA NW      |
|    |    |    | 24 | AGUA FRIA NE      |
| 28 |    | 30 | 28 | MONTOSO PEAK SE   |
|    |    |    | 30 | AGUA FRIA SE      |
|    |    |    | 34 | TETILLA PEAK NE   |
| 34 | 35 | 36 | 35 | TURQUOISE HILL NW |
|    |    |    | 36 | TURQUOISE HILL NE |

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AGUA FRIA SW, NEW MEXICO  
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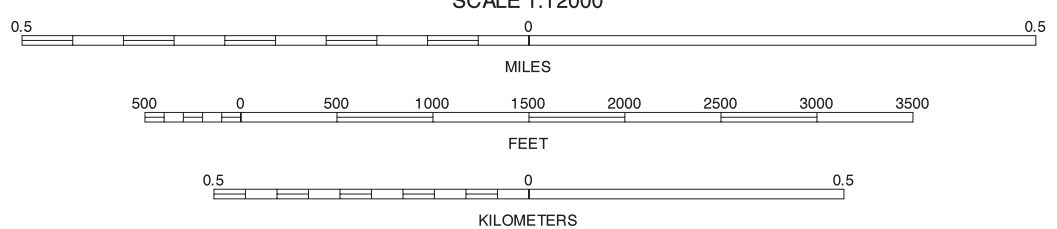
Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.





Joins sheet 31 Santa Fe SW

North American Datum of 1983(NAD83). GRS80 Spheroid  
1000-meter ticks: Universal Transverse Mercator, zone 13.  
Coordinate grid ticks and land division data, if shown, are  
approximately positioned. Digital data are available for  
this quadrangle.

QUARTER QUADRANGLE  
LOCATION

|    |    |    |                      |
|----|----|----|----------------------|
| 23 | 24 | 25 | 23 AGUA FRIA NW      |
|    |    |    | 24 AGUA FRIANE       |
|    |    |    | 25 SANTA FE NW       |
| 29 |    | 31 | 29 AGUA FRIA SW      |
|    |    |    | 31 SANTA FE SW       |
|    |    |    | 35 TURQUOISE HILL NW |
| 35 | 36 | 37 | 36 TURQUOISE HILL NE |
|    |    |    | 37 SETON VILLAGE NW  |

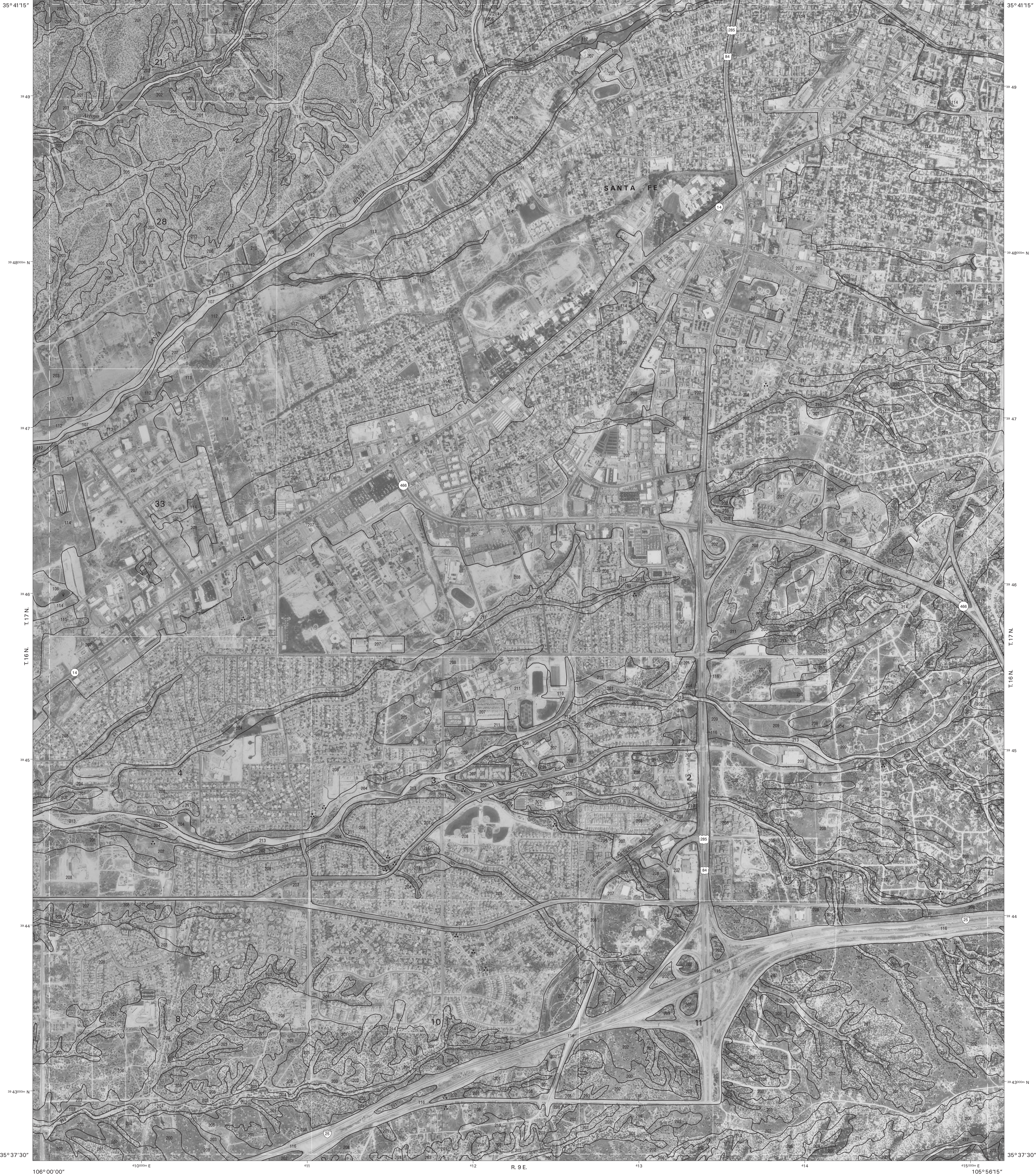
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AGUA FRIA SE, NEW MEXICO  
3.75 MINUTE SERIES  
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 37  
Seton Village NW

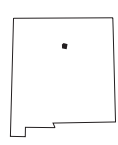




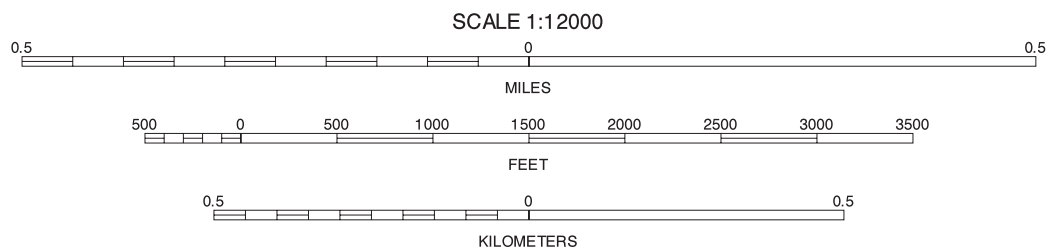
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 24 | 25 | 26 |
| 24 | 25 | 26 |
| 24 | 25 | 26 |
| 24 | 25 | 26 |

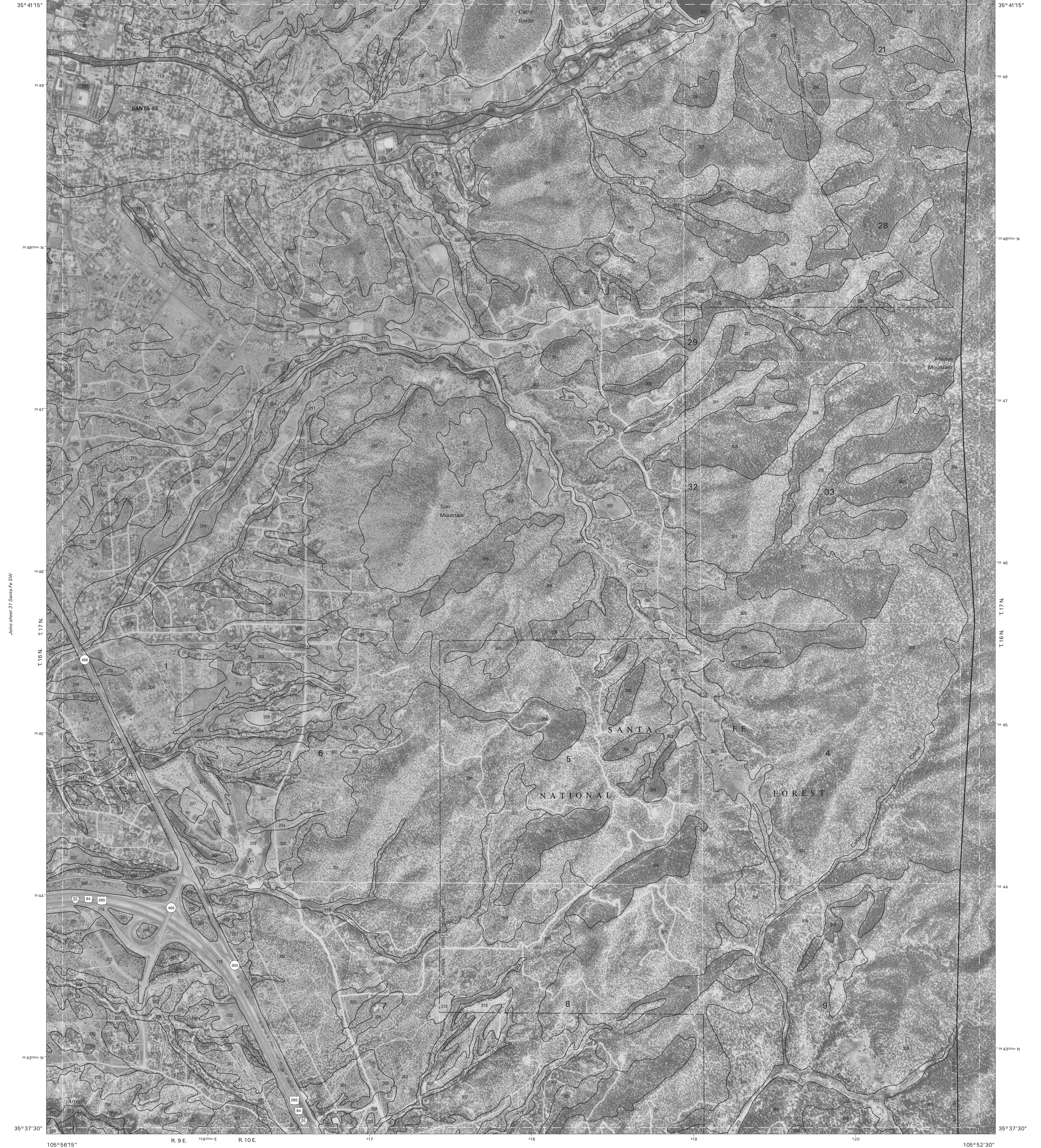
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Joins sheet 25  
Santa Fe NW



Joins sheet 31 Santa Fe SW

Joins sheet 27  
Seton Village NW

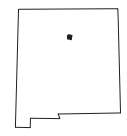
Joins sheet 38 Seton Village NE

Joins sheet 39  
Glorieta NW

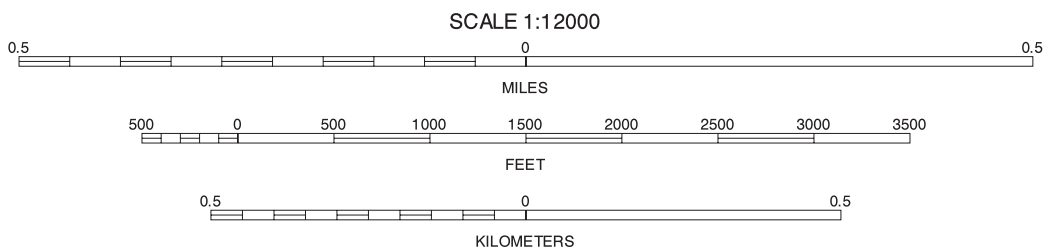
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 25 | 26 |    |
| 31 |    |    |
| 37 | 38 | 39 |

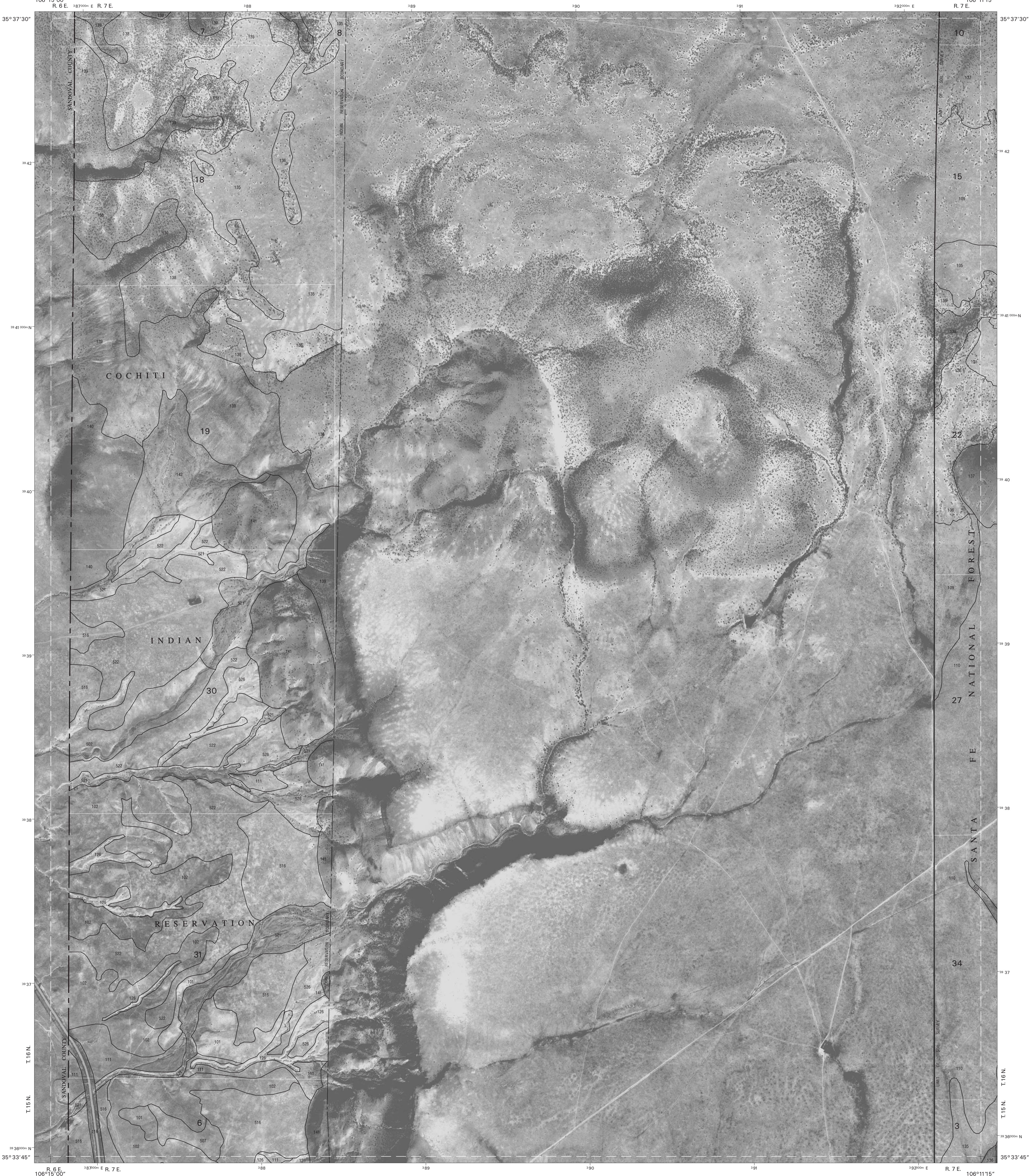
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|    |                  |
|----|------------------|
| 25 | SANTA FE NW      |
| 26 | SANTA FE NE      |
| 31 | SANTA FE SW      |
| 37 | SETON VILLAGE NW |
| 38 | SETON VILLAGE NE |
| 39 | GLORIETA NW      |

SANTA FE SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 32 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

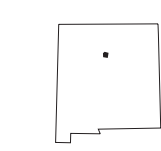




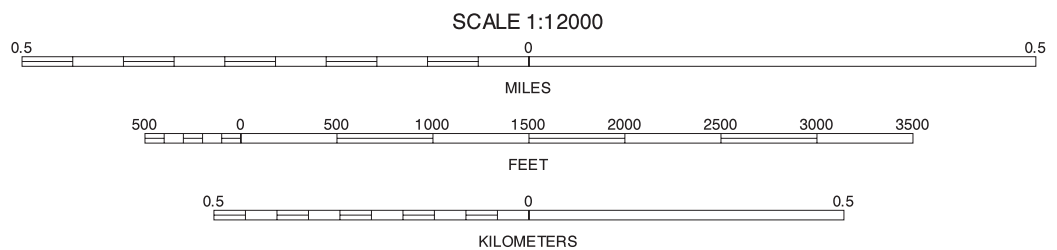
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                    |
|----|----|----|--------------------|
|    | 27 | 28 | 27 MONTOSO PEAK SW |
|    |    |    | 28 MONTOSO PEAK SE |
|    | 34 | 34 | 34 TETILLA PEAK NE |
| 42 | 43 | 42 | 42 TETILLA PEAK SW |
|    |    | 43 | 43 TETILLA PEAK SE |

INDEX TO ADJOINING 3.75 MAPS

TETILLA PEAK NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 33 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 28 Montoso Peak SE

R. 7 E. R. 8 E.

Joins sheet 29  
Agua Fria NW



Joins sheet 33 Tetilla Peak NW

Joins sheet 35 Turquoise Hill NW

106°11'15"

R. 7 E. R. 8 E.

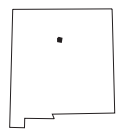
106°07'30"

Joins sheet 43 Tetilla Peak SE

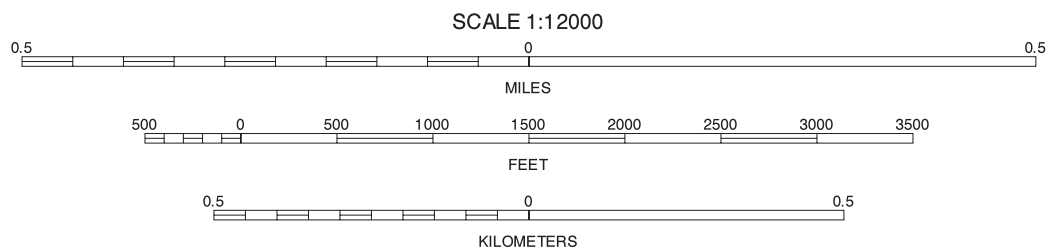
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                      |
|----|----|----|----------------------|
| 27 | 28 | 29 | 27 MONTOSO PEAK SW   |
|    |    |    | 28 MONTOSO PEAK SE   |
|    |    |    | 29 AGUA FRIA SW      |
| 33 |    | 35 | 33 TETILLA PEAK NW   |
|    |    |    | 35 TURQUOISE HILL NW |
|    |    |    | 42 TETILLA PEAK SW   |
| 42 | 43 | 44 | 43 TETILLA PEAK SE   |
|    |    |    | 44 TURQUOISE HILL SW |

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TETILLA PEAK NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 34 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.

Joins sheet 34  
Turquoise Hill SW



Joins sheet 29 Agua Fria SW

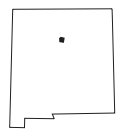
R. 8 E.

Joins sheet 44 Turquoise Hill SW

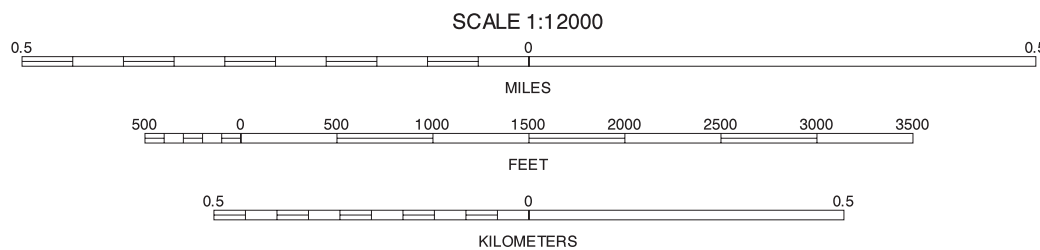
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                      |
|----|----|----|----------------------|
| 28 | 29 | 30 | 28 MONTOSO PEAK SE   |
|    |    |    | 29 AGUA FRIA SW      |
|    |    |    | 30 AGUA FRIA SE      |
| 34 |    | 36 | 34 TETILLA PEAK NE   |
|    |    |    | 36 TURQUOISE HILL NE |
|    |    |    | 43 TETILLA PEAK SE   |
| 43 | 44 | 45 | 44 TURQUOISE HILL SW |
|    |    |    | 45 TURQUOISE HILL SE |

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TURQUOISE HILL NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 35 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

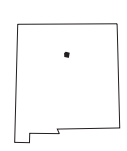




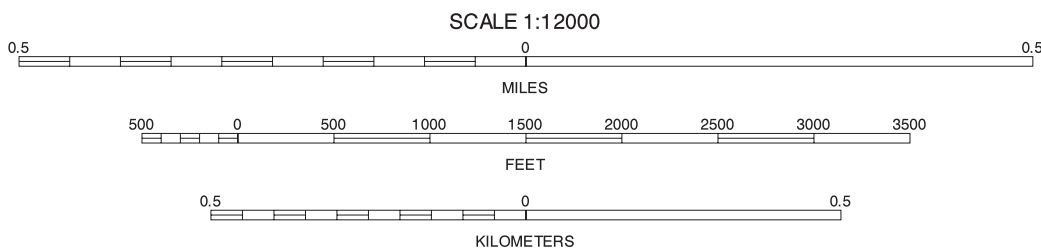
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs created by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 29 | 30 | 31 |
| 35 | 36 | 37 |
| 44 | 45 | 46 |

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29 AGUA FRIA SW  
30 AGUA FRIA SE  
31 SANTA FE SW  
35 TURQUOISE HILL NW  
37 SETON VILLAGE NW  
44 TURQUOISE HILL SW  
45 TURQUOISE HILL SE  
46 SETON VILLAGE SW

TURQUOISE HILL NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 36 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Joins sheet 31 Santa Fe SW

R. 9 E.

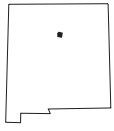
Joins sheet 46 Seton Village SW



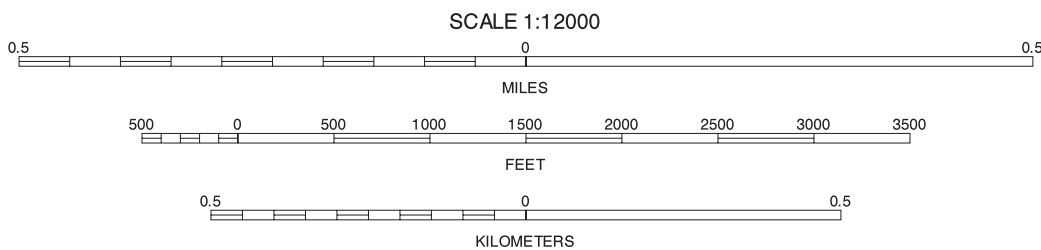
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 30 | 31 | 32 |
| 36 |    | 38 |
| 45 | 46 | 47 |

INDEX TO ADJOINING 3.75 MAPS

30 AGUA FRIA SE  
31 SANTA FE SW  
32 SANTA FE SE  
36 TURQUOISE HILL NE  
38 SETON VILLAGE NE  
45 TURQUOISE HILL SE  
46 SETON VILLAGE SW  
47 SETON VILLAGE SE

SETON VILLAGE NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 37 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 32 Santa Fe SE

R. 10 E.

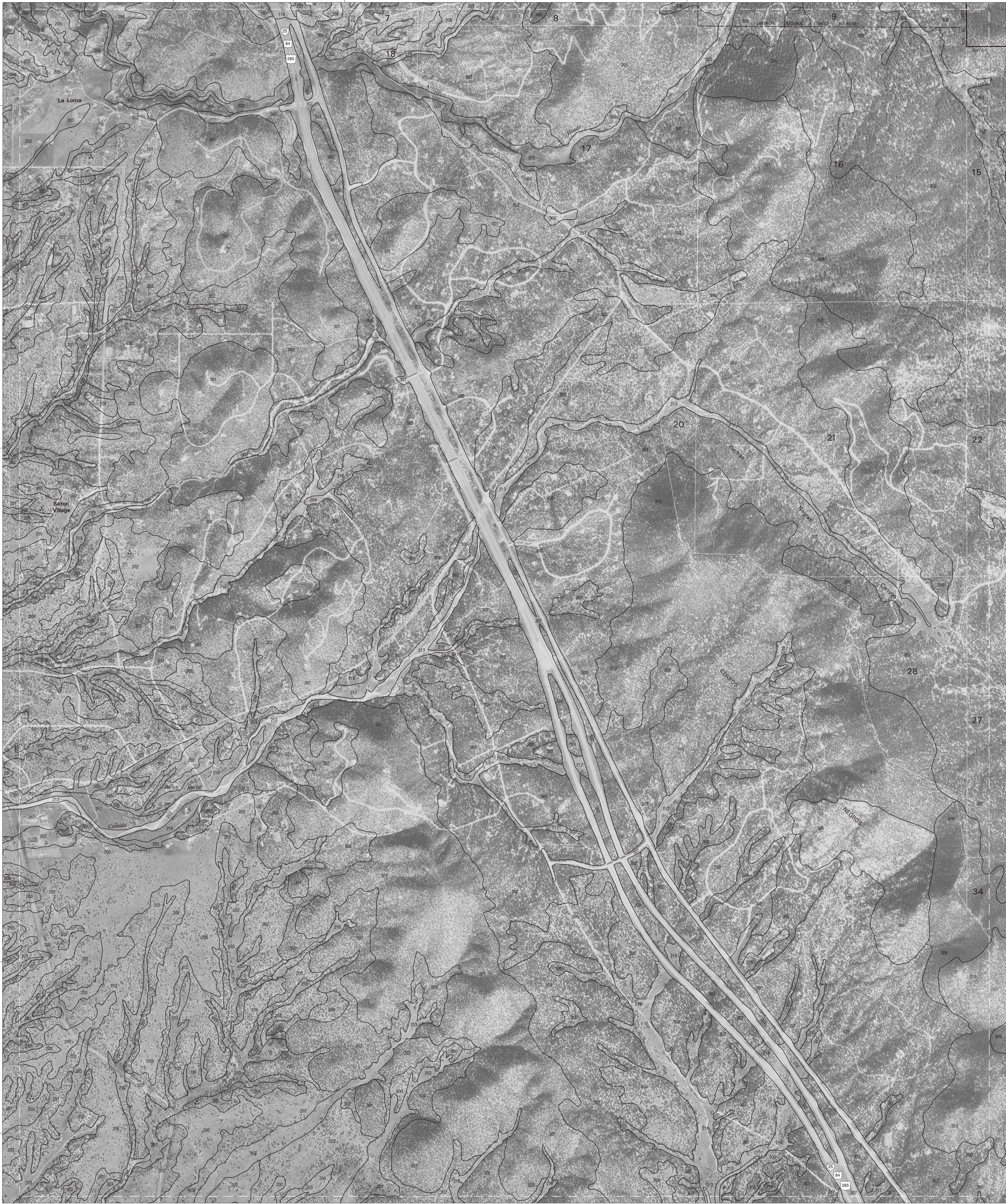
Joins sheet 47 Seton Village SE

Joins sheet 48  
Glorieta SW

Joins sheet 37  
Santa Fe NW

Joins sheet 37 Seton Village NW

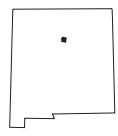
Joins sheet 39 Glorieta NW



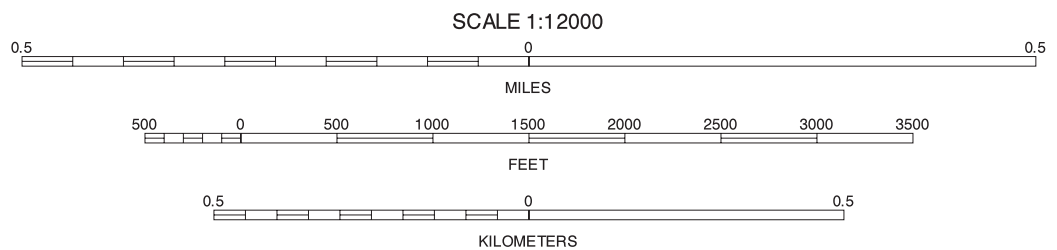
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs created by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                                                              |
|----|----|----|--------------------------------------------------------------|
| 31 | 32 |    | 31 SANTA FE SW<br>32 SANTA FE SE                             |
| 37 |    | 39 | 37 SETON VILLAGE NW<br>39 GLORIETA NW                        |
| 46 | 47 | 48 | 46 SETON VILLAGE SW<br>47 SETON VILLAGE SE<br>48 GLORIETA SW |

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SETON VILLAGE NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 38 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 32  
Santa Fe NE

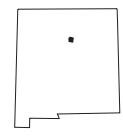


Joins sheet 41  
Saton Village SE

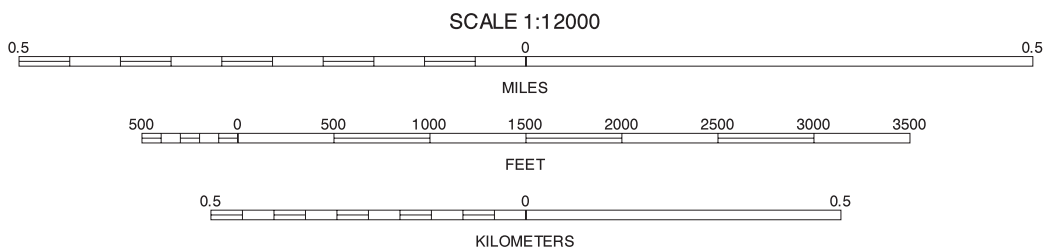
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |  |    |    |                  |
|----|--|----|----|------------------|
| 32 |  |    | 32 | SANTA FE SE      |
| 38 |  | 40 | 38 | SETON VILLAGE NE |
|    |  |    | 40 | GLORIETA NE      |
|    |  |    | 47 | SETON VILLAGE SE |
|    |  |    | 48 | GLORIETA SW      |
|    |  |    | 49 | GLORIETA SE      |

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GLORIETA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 39 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 49  
Glorieta SE

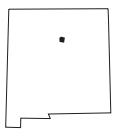




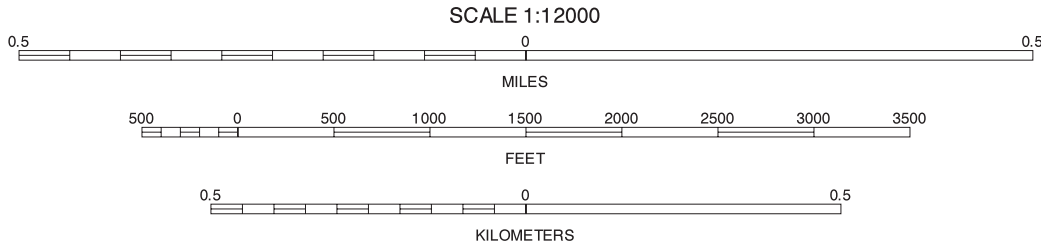
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 39 | 40 | 41 |
| 48 | 49 | 50 |

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GLORIETA NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 40 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





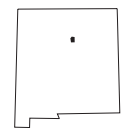
Joins sheet 40 Glorieta NE

Joins sheet 49  
Glorieta SE

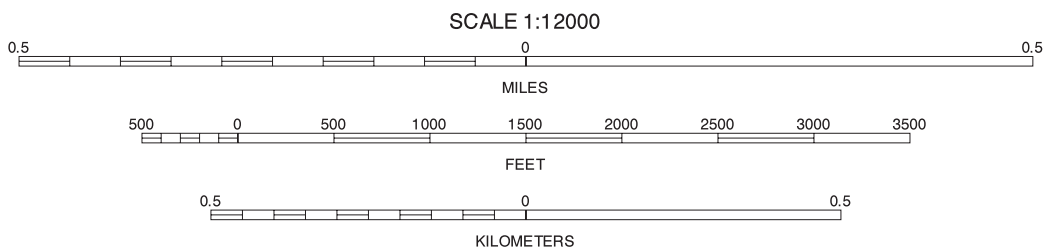
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |             |
|----|-------------|
| 40 | GLORIETA NE |
| 49 | GLORIETA SE |
| 50 | PECOS SW    |

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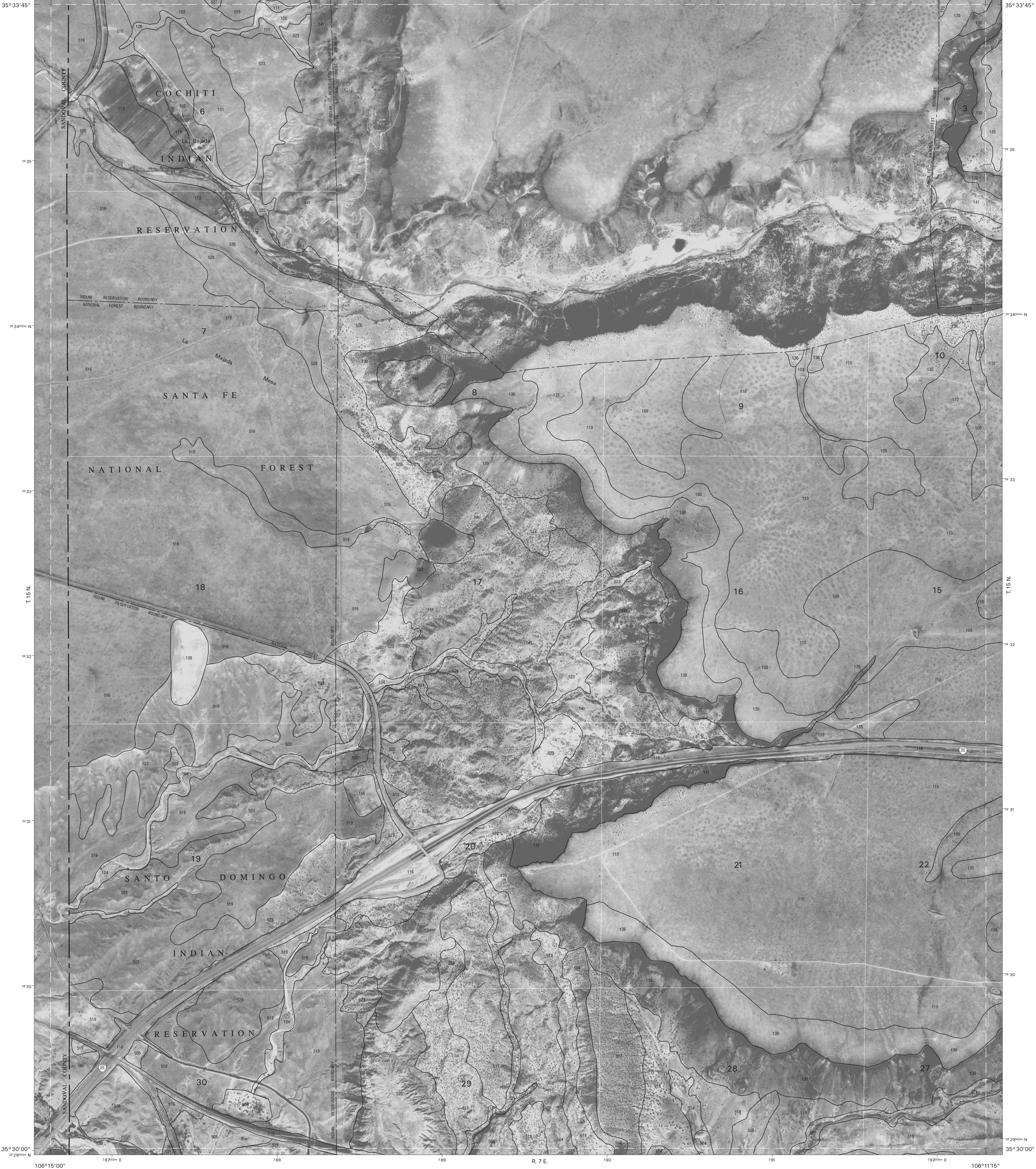
PECOS NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 41 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 33 Tetilla Peak NW

Joins sheet 28  
Tetilla Peak NE



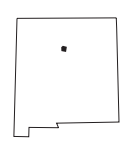
Joins sheet 51 Madrid NW

Joins sheet 52  
Madrid NE

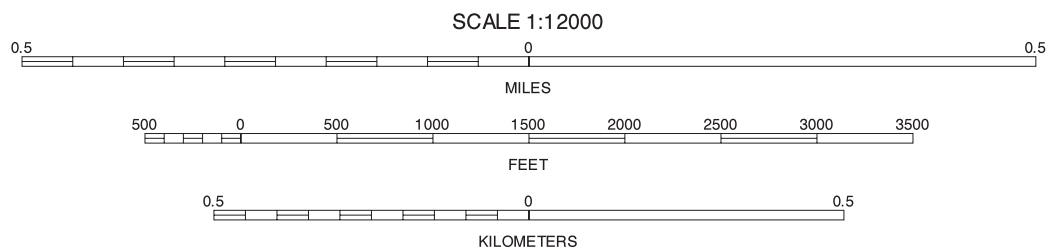
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



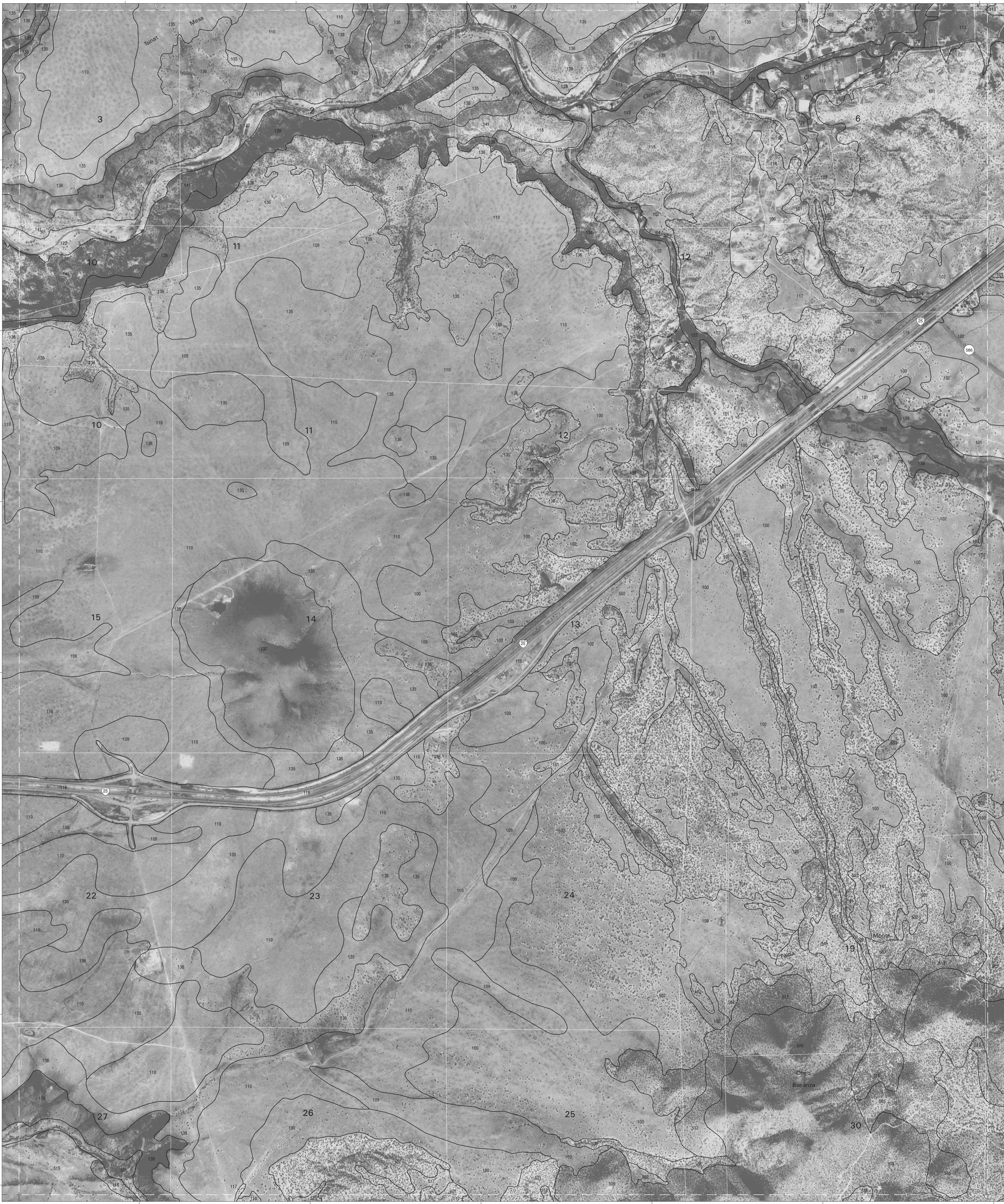
|  |    |    |                    |
|--|----|----|--------------------|
|  | 33 | 34 | 33 TETILLA PEAK NW |
|  |    |    | 34 TETILLA PEAK NE |
|  |    | 43 | 43 TETILLA PEAK SE |
|  | 51 | 52 | 51 MADRID NW       |
|  |    |    | 52 MADRID NE       |

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TETILLA PEAK SW, NEW MEXICO  
3.75 MINUTE SERIES  
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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

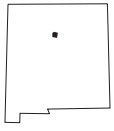




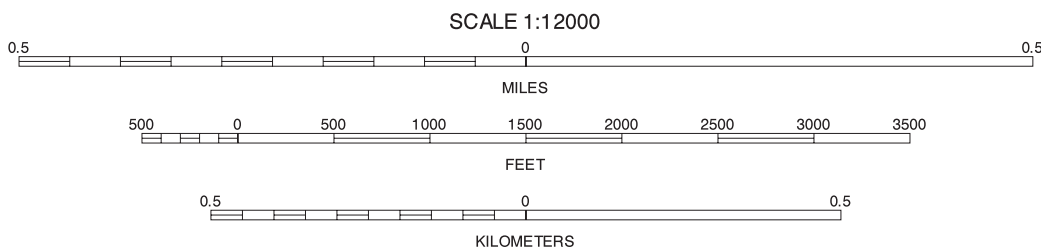
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 33 | 34 | 35 |
| 42 | 44 |    |
| 51 | 52 | 53 |

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TETILLA PEAK SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 43 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



Joins sheet 32  
Tetilla Peak NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

106° 07' 30"

Joins sheet 35 Turquoise Hill NW

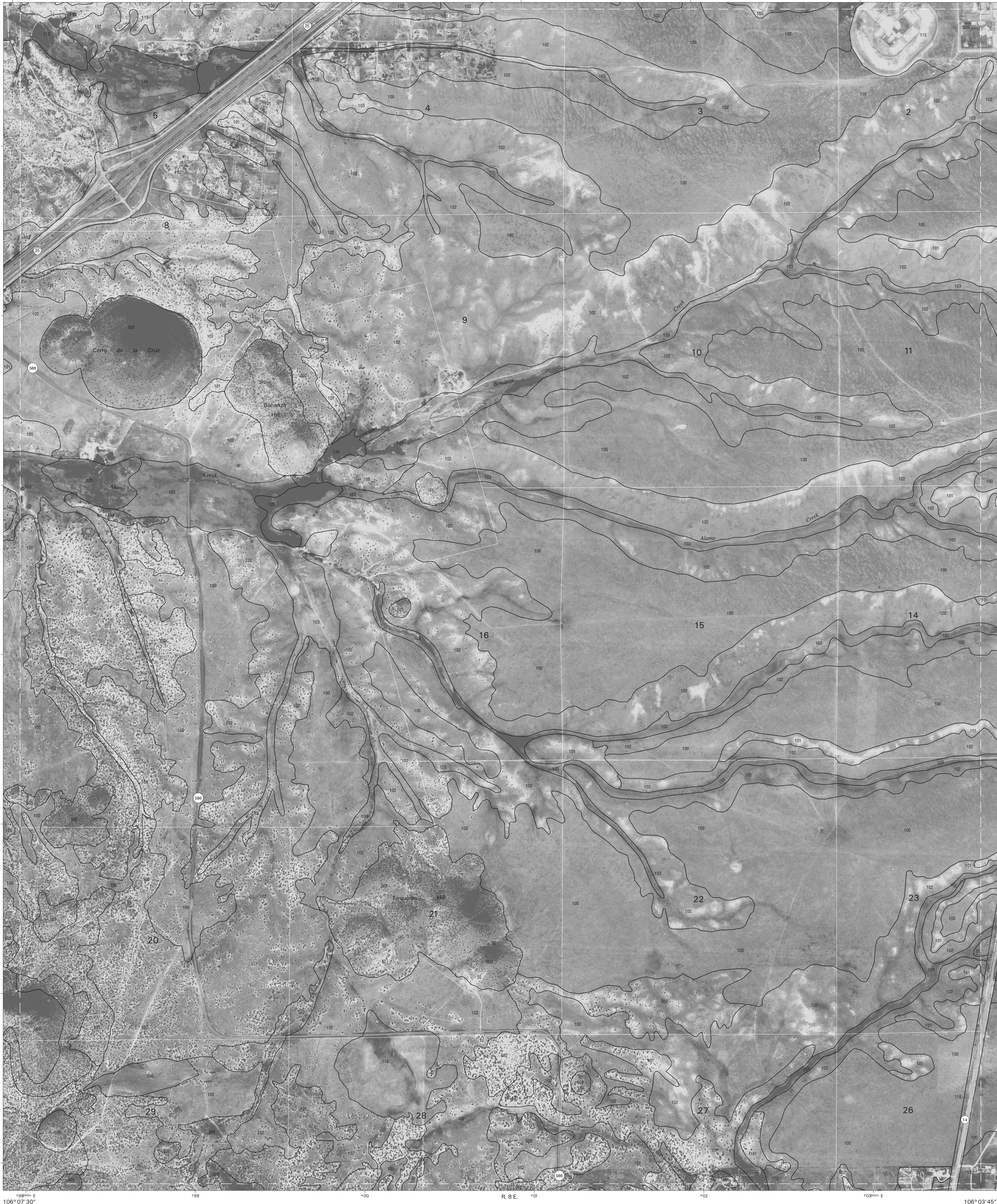
SANTA FE COUNTY AREA, NEW MEXICO  
TURQUOISE HILL SW QUADRANGLE  
SHEET NUMBER 44 OF 122

106° 03' 45"

Joins sheet 36  
Turquoise Hill NE

Joins sheet 43 Tetilla Peak SE

Joins sheet 45 Turquoise Hill SE

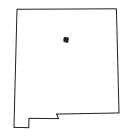


Joins sheet 52  
Madrid NE

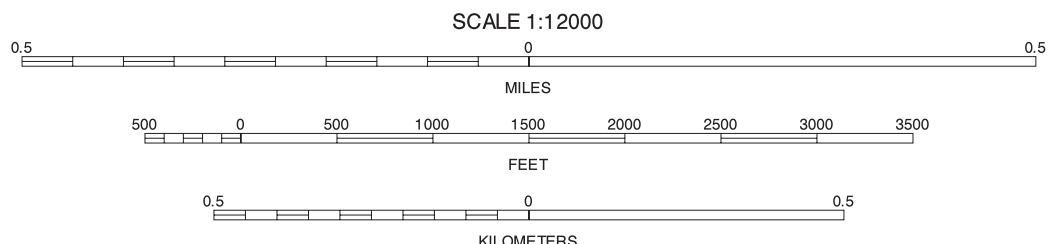
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                         |
|----|----|----|-------------------------|
| 34 | 35 | 36 | 34<br>TETILLA PEAK NE   |
|    |    |    | 35<br>TURQUOISE HILL NW |
|    |    |    | 36<br>TURQUOISE HILL NE |
| 43 |    | 45 | 43<br>TETILLA PEAK SE   |
|    |    |    | 45<br>TURQUOISE HILL SE |
|    |    |    | 52<br>MADRID NE         |
| 52 | 53 | 54 | 53<br>PICTURE ROCK NW   |
|    |    |    | 54<br>PICTURE ROCK NE   |

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TURQUOISE HILL SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 44 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjoining map sheets.

Joins sheet 54  
Picture Rock NE



Joins sheet 35  
Turquoise Hill NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
106°03'45"

SANTA FE COUNTY AREA, NEW MEXICO  
TURQUOISE HILL SE QUADRANGLE  
SHEET NUMBER 45 OF 122  
106°00'00"

Joins sheet 37  
Seton Village NW



Joins sheet 44  
Turquoise Hill SW

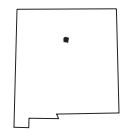
Joins sheet 46  
Seton Village SW

Joins sheet 52  
Picture Rock NW

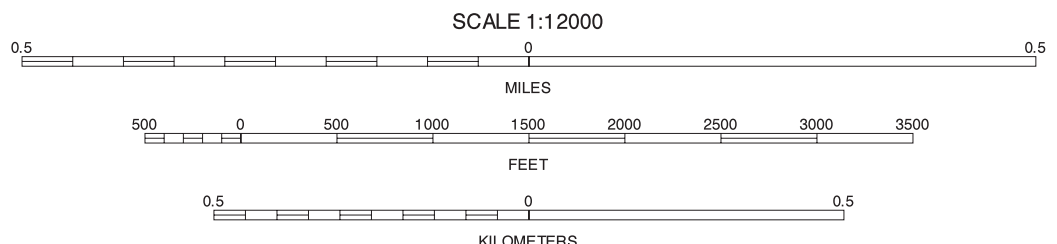
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                      |
|----|----|----|----------------------|
| 35 | 36 | 37 | 35 TURQUOISE HILL NW |
| 36 | 37 | 38 | 36 TURQUOISE HILL NE |
| 37 | 38 | 39 | 37 SETON VILLAGE NW  |
| 38 | 39 | 40 | 38 TURQUOISE HILL SW |
| 39 | 40 | 41 | 39 SETON VILLAGE SW  |
| 40 | 41 | 42 | 40 PICTURE ROCK NW   |
| 41 | 42 | 43 | 41 PICTURE ROCK NE   |
| 42 | 43 | 44 | 42 GALISTEO NW       |

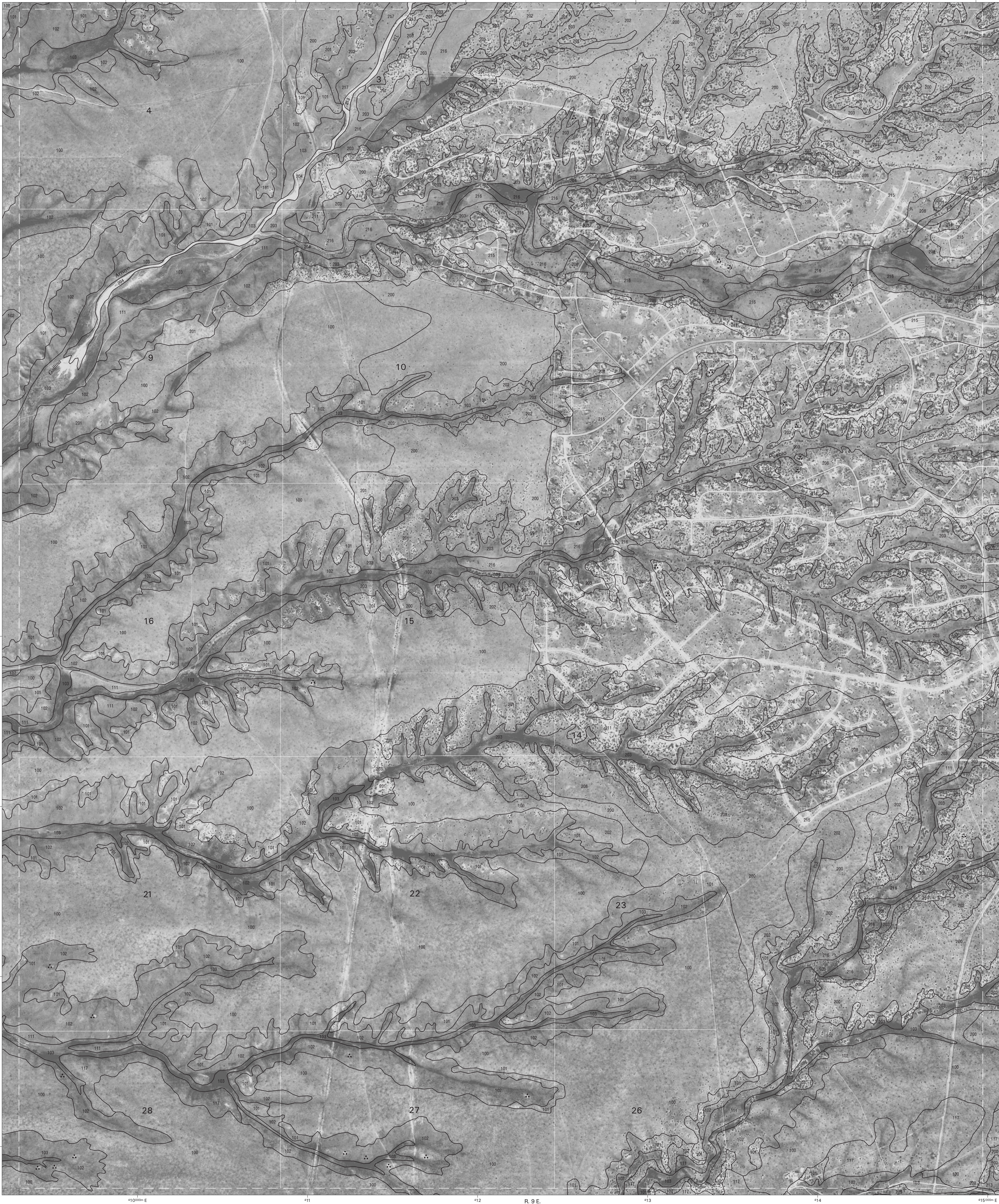
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TURQUOISE HILL SE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 45  
Gallina NW

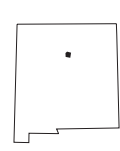




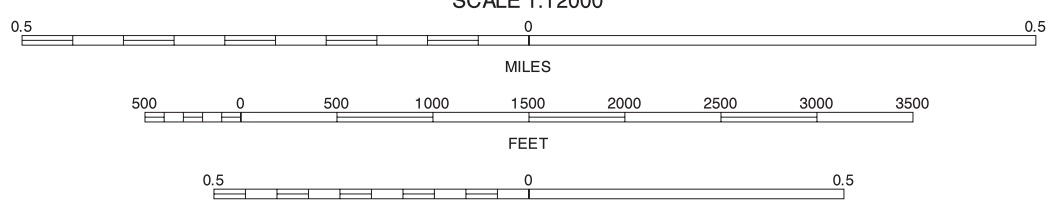
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 36 | 37 | 38 |
| 45 | 46 | 47 |
| 54 | 55 | 56 |

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|    |                   |
|----|-------------------|
| 36 | TURQUOISE HILL NE |
| 37 | SETON VILLAGE NW  |
| 38 | SETON VILLAGE NE  |
| 45 | TURQUOISE HILL SE |
| 47 | SETON VILLAGE SE  |
| 54 | PICTURE ROCK NE   |
| 55 | GALISTEO NW       |
| 56 | GALISTEO NE       |

SETON VILLAGE SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 46 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

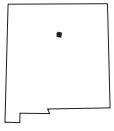




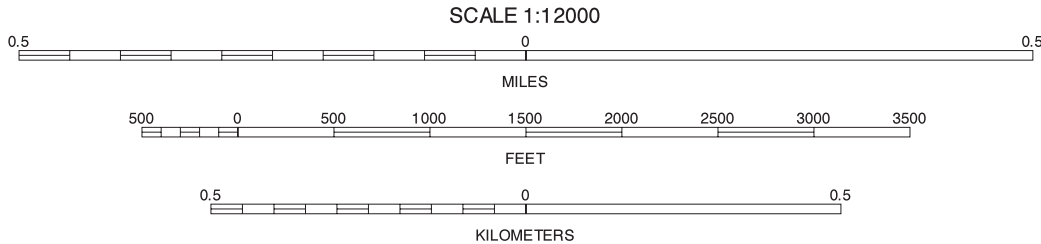
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                     |
|----|----|----|---------------------|
| 37 | 38 | 39 | 37 SETON VILLAGE NW |
|    |    |    | 38 SETON VILLAGE NE |
|    |    |    | 39 GLORIETA NW      |
| 46 |    | 48 | 46 SETON VILLAGE SW |
|    |    |    | 48 GLORIETA SW      |
|    |    |    | 55 GALISTEO NW      |
|    |    |    | 56 GALISTEO NE      |
| 55 | 56 | 57 | 57 BULL CANYON NW   |

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SETON VILLAGE SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 47 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.

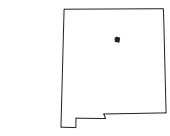




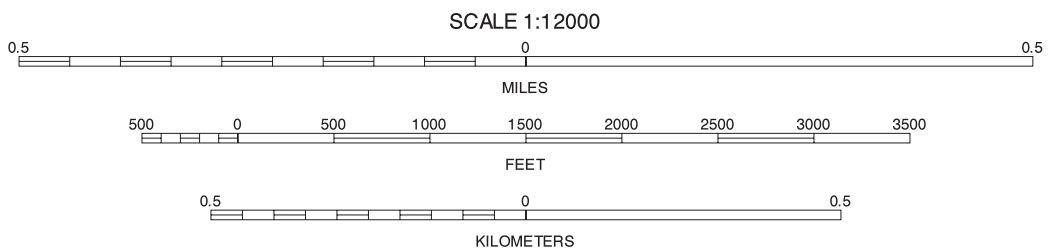
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 38 | 39 | 40 |
| 47 | 48 | 49 |
| 56 | 57 | 58 |

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38 SETON VILLAGE NE  
39 GLORIETA NW  
40 GLORIETA NE  
47 SETON VILLAGE SE  
49 GLORIETA SE  
56 GALISTEO NE  
57 BULL CANYON NW  
58 BULL CANYON NE

GLORIETA SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 48 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



Joins sheet 40 Glorieta NE

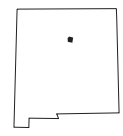
R. 11 E.

Joins sheet 58 Bull Canyon NE

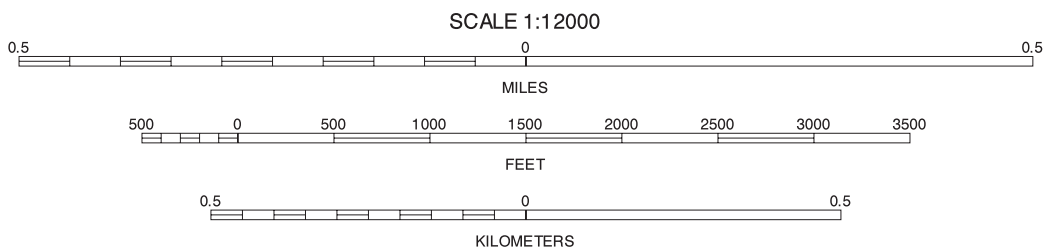
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                   |
|----|----|----|-------------------|
| 39 | 40 | 41 | 39 GLORIETA NW    |
|    |    |    | 40 GLORIETA NE    |
| 48 |    | 50 | 41 PECOS NW       |
|    |    |    | 48 GLORIETA SW    |
| 57 | 58 | 59 | 50 PECOS SW       |
|    |    |    | 57 BULL CANYON NW |
|    |    |    | 58 BULL CANYON NE |
|    |    |    | 59 ROWE NW        |

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GLORIETA SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 49 OF 122

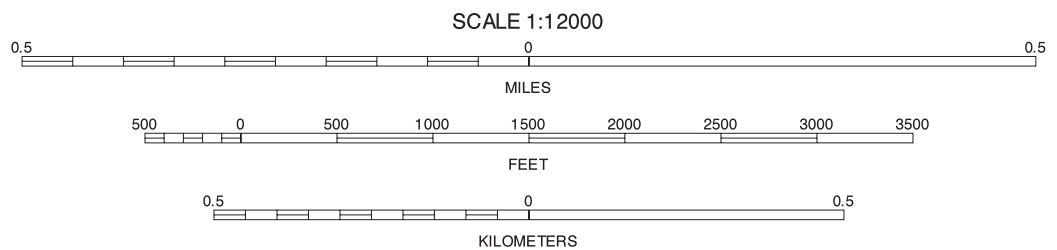
Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.

Joins sheet 59  
Rowe NW





North American Datum of 1983(NAD83). GRS80 Spheroid  
1000-meter ticks: Universal Transverse Mercator, zone 13.  
Coordinate grid ticks and land division data, if shown, are  
approximately positioned. Digital data are available for  
this quadrangle.



|    |    |                                 |
|----|----|---------------------------------|
| 40 | 41 | 40 GLORIETA NE<br>41 PECOS NW   |
| 49 |    | 49 GLORIETA SE                  |
| 58 | 59 | 58 BULL CANYON NE<br>59 ROWE NW |

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Joins sheet 42 Tetilla Peak SW

Joins sheet 43  
Tetilla Peak SE



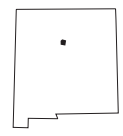
Joins sheet 60 Madrid SW

Joins sheet 61  
Madrid SE

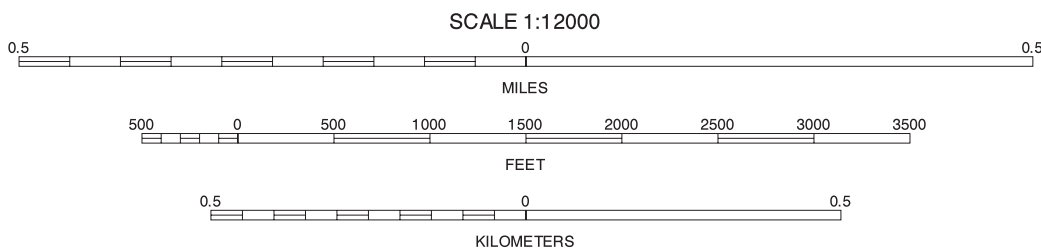
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|  |    |    |                    |
|--|----|----|--------------------|
|  | 42 | 43 | 42 TETILLA PEAK SW |
|  |    | 52 | 52 MADRID NE       |
|  | 60 | 61 | 60 MADRID SW       |
|  |    |    | 61 MADRID SE       |

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MADRID NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 51 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

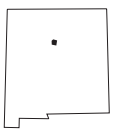




This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

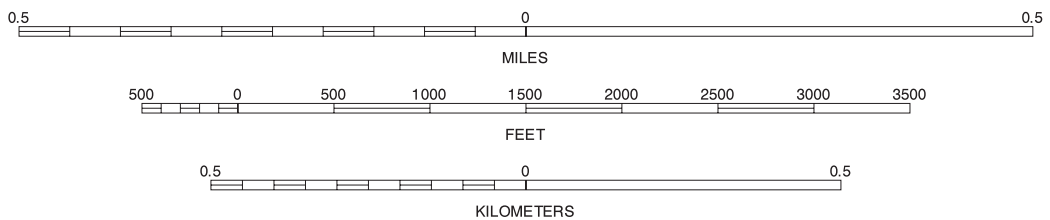
NORTH



QUARTER QUADRANGLE LOCATION

Joins sheet 61 Madrid SE

SCALE 1:12000



|    |    |    |    |                   |
|----|----|----|----|-------------------|
| 42 | 43 | 44 | 42 | TETILLA PEAK SW   |
| 43 | 44 | 45 | 43 | TETILLA PEAK SE   |
| 44 | 45 | 46 | 44 | TURQUOISE HILL SW |
| 45 | 46 | 47 | 45 | MADRID NW         |
| 46 | 47 | 48 | 46 | PICTURE ROCK NW   |
| 47 | 48 | 49 | 47 | MADRID SW         |
| 48 | 49 | 50 | 48 | MADRID SE         |
| 49 | 50 | 51 | 49 | PICTURE ROCK SW   |

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MADRID NE, NEW MEXICO  
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SHEET NUMBER 52 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 62  
Picture Rock SW



Joins sheet 42  
Turquoise Hill SW

Joins sheet 44 Turquoise Hill SW

Joins sheet 48  
Turquoise Hill SE



Joins sheet 52 Madrid NE

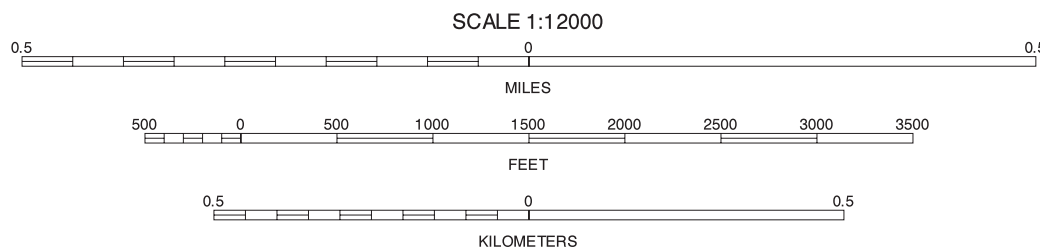
Joins sheet 54 Picture Rock NE

Joins sheet 51  
Madrid SW

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



|    |    |    |    |
|----|----|----|----|
| 43 | 44 | 45 | 43 |
| 52 | 54 | 54 | 52 |
| 61 | 62 | 63 | 61 |

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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 53  
Picture Rock SE



Joins sheet 45 Turquoise Hill SE

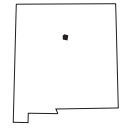
Joins sheet 46  
Seton Village SW



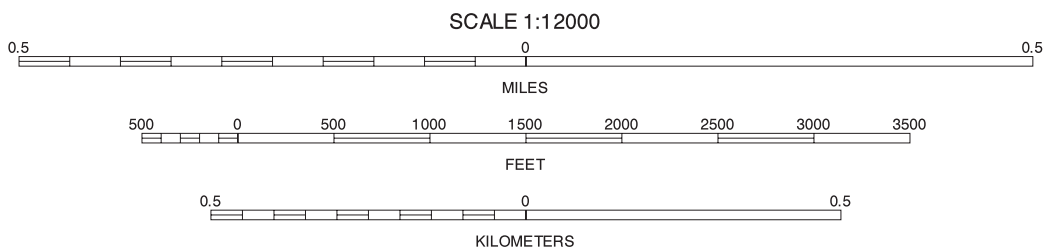
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |    |                   |
|----|----|----|----|-------------------|
| 44 | 45 | 46 | 44 | TURQUOISE HILL SW |
| 45 | 46 | 47 | 45 | TURQUOISE HILL SE |
| 46 | 47 | 48 | 46 | SETON VILLAGE SW  |
| 47 | 48 | 49 | 47 | SETON VILLAGE SE  |
| 48 | 49 | 50 | 48 | PICTURE ROCK NW   |
| 49 | 50 | 51 | 49 | PICTURE ROCK NE   |
| 50 | 51 | 52 | 50 | PICTURE ROCK SW   |
| 51 | 52 | 53 | 51 | PICTURE ROCK SE   |
| 52 | 53 | 54 | 52 | GALISTEO SW       |
| 53 | 54 | 55 | 53 | GALISTEO SE       |

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PICTURE ROCK NE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 64  
Galisteo NW

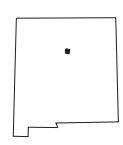




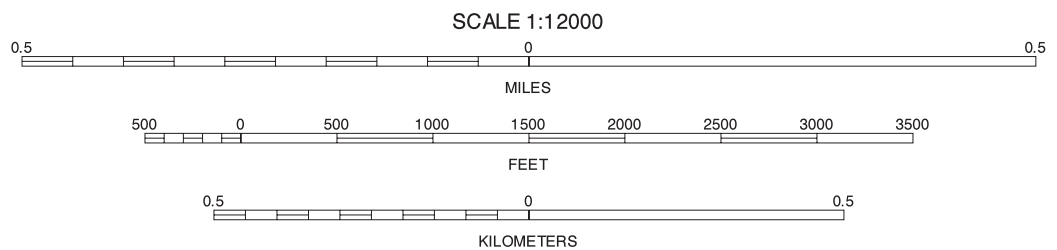
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



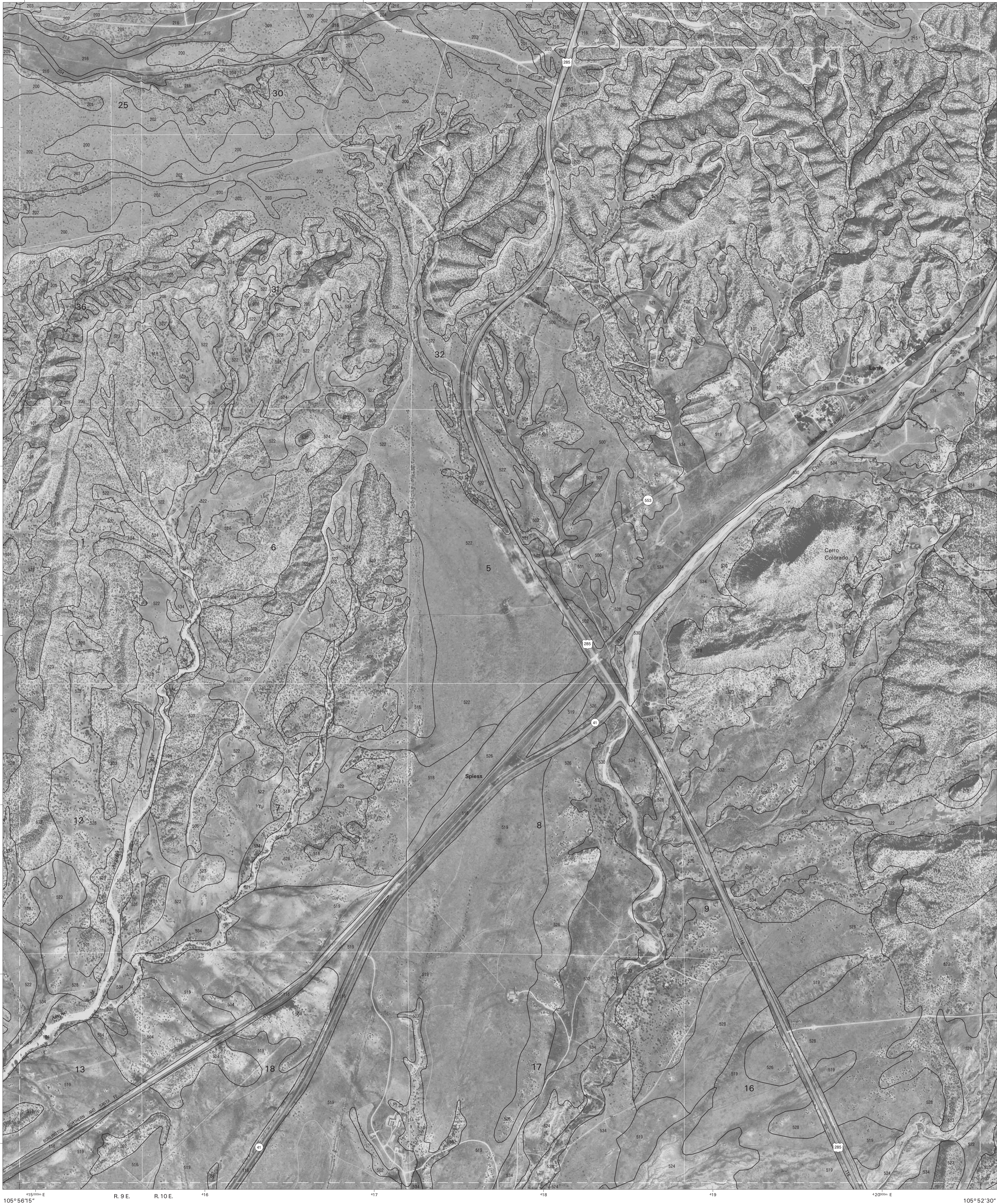
|    |    |    |    |                   |
|----|----|----|----|-------------------|
| 45 | 46 | 47 | 45 | TURQUOISE HILL SE |
| 46 | 47 | 48 | 46 | SETON VILLAGE SW  |
| 47 | 48 | 49 | 47 | SETON VILLAGE SE  |
| 48 | 49 | 50 | 48 | PICTURE ROCK NE   |
| 49 | 50 | 51 | 49 | GALISTEO NE       |
| 50 | 51 | 52 | 50 | PICTURE ROCK SE   |
| 51 | 52 | 53 | 51 | GALISTEO SW       |
| 52 | 53 | 54 | 52 | GALISTEO SE       |

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GALISTEO NW, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

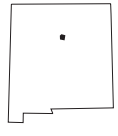




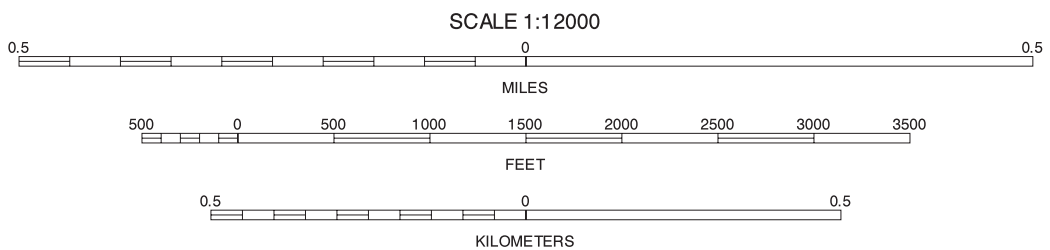
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |    |
|----|----|----|
| 46 | 47 | 48 |
| 55 | 56 | 57 |
| 64 | 65 | 66 |

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GALISTEO NE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



Joins sheet 48 Glorieta SW

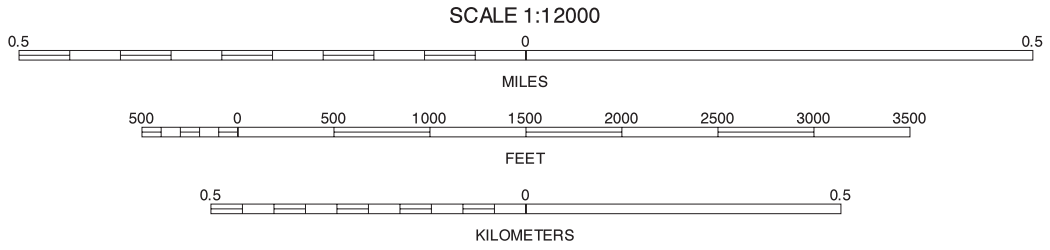
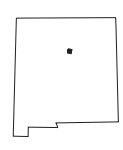
Joins sheet 49  
Glorieta SE



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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



|    |    |    |    |                  |
|----|----|----|----|------------------|
| 47 | 48 | 49 | 47 | SETON VILLAGE SE |
|    |    |    | 48 | GLORIETA SW      |
|    |    |    | 49 | GLORIETA SE      |
| 56 |    | 58 | 56 | GALISTEO NE      |
|    |    |    | 58 | BULL CANYON NE   |
|    |    |    | 65 | GALISTEO SE      |
|    |    |    | 66 | BULL CANYON SW   |
| 65 | 66 | 67 | 67 | BULL CANYON SE   |

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BULL CANYON NW, NEW MEXICO  
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SHEET NUMBER 57 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 67  
Bull Canyon SE

Joins sheet 66 Bull Canyon SW

Joins sheet 56 Galisteo NE

Joins sheet 58 Bull Canyon NE

Joins sheet 47  
Seton Village SE

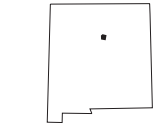




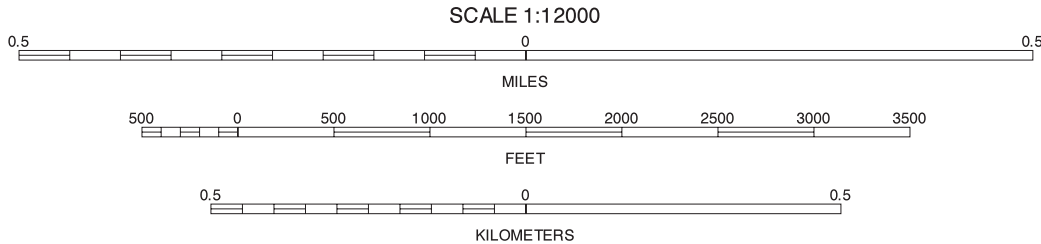
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |    |                   |
|----|----|----|-------------------|
| 48 | 49 | 50 | 48 GLORIETA SW    |
|    |    |    | 49 GLORIETA SE    |
|    |    |    | 50 PECOS SW       |
| 57 |    | 59 | 57 BULL CANYON NW |
|    |    |    | 59 ROWE NW        |
|    |    |    | 66 BULL CANYON SW |
|    |    |    | 67 BULL CANYON SE |
| 66 | 67 | 68 | 68 ROWE SW        |

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Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

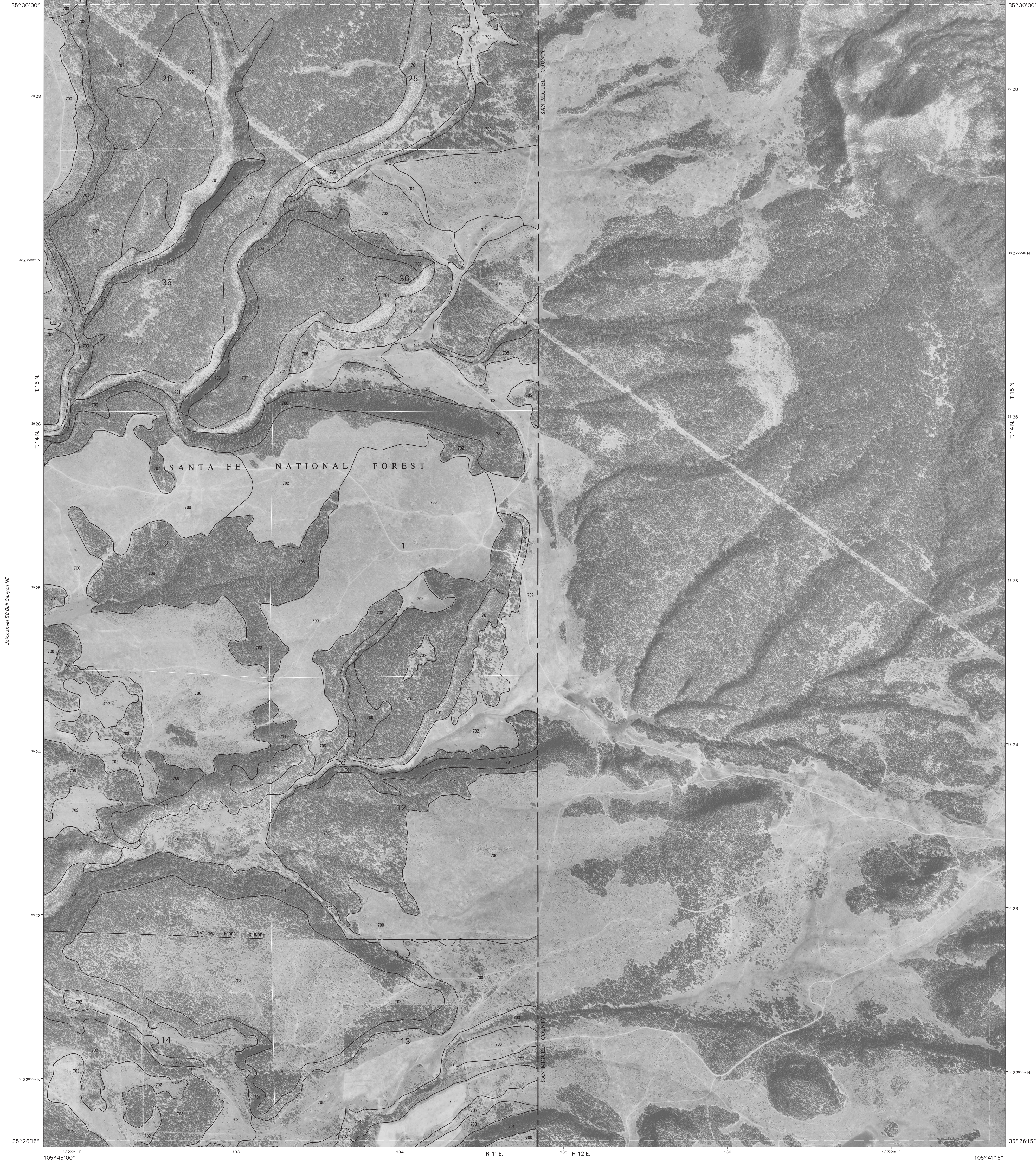


Joins sheet 49  
Glorieta SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 50 Pecos SW

SANTA FE COUNTY AREA, NEW MEXICO  
ROWE NW QUADRANGLE  
SHEET NUMBER 59 OF 122



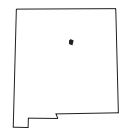
Joins sheet 58 Bull Canyon NE

Joins sheet 67  
Bull Canyon SE

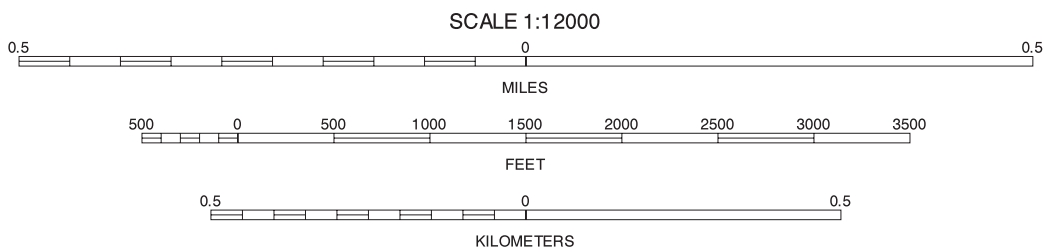
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |  |                                                      |
|----|----|--|------------------------------------------------------|
| 49 | 50 |  | 49 GLORIETA SE<br>50 PECOS SW                        |
| 58 |    |  | 58 BULL CANYON NE<br>67 BULL CANYON SE<br>68 ROWE SW |
| 67 | 68 |  |                                                      |

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ROWE NW, NEW MEXICO  
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SHEET NUMBER 59 OF 122

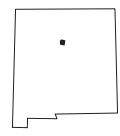
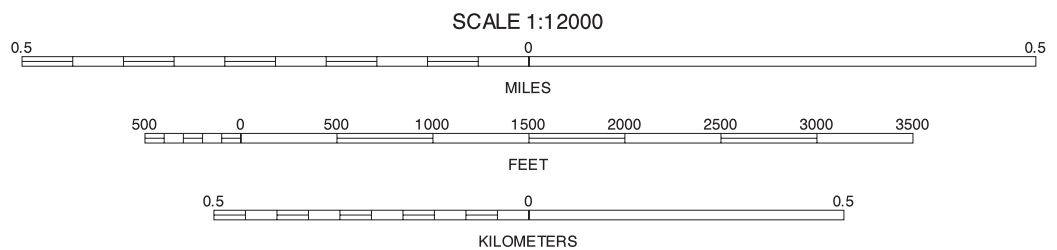
Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjoining map sheets.





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North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANT  
LOCATION

|  |    |    |              |
|--|----|----|--------------|
|  | 51 | 52 | 51 MADRID NW |
|  |    |    | 52 MADRID NE |
|  |    | 61 | 61 MADRID SE |
|  | 69 | 70 | 69 GOLDEN NW |
|  |    |    | 70 GOLDEN NE |

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MADRID SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 60 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Joins sheet 51  
Madrid NW

Joins sheet 52 Madrid NE

Joins sheet 53  
Picture Rock NW



Joins sheet 60 Madrid SW

Joins sheet 62 Picture Rock SW

Joins sheet 69  
Golden NW

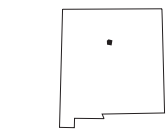
Joins sheet 70 Golden NE

Joins sheet 71  
Captain Davis Mountain NW

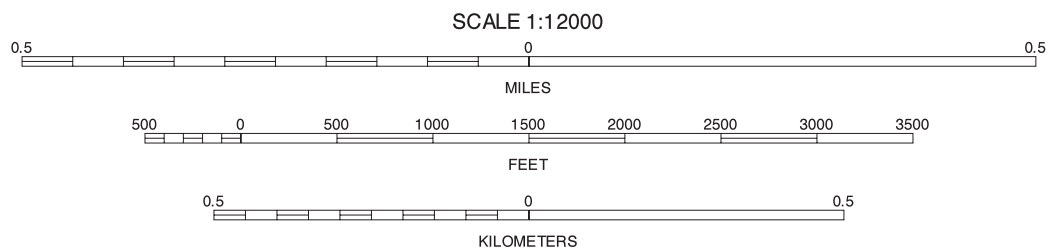
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



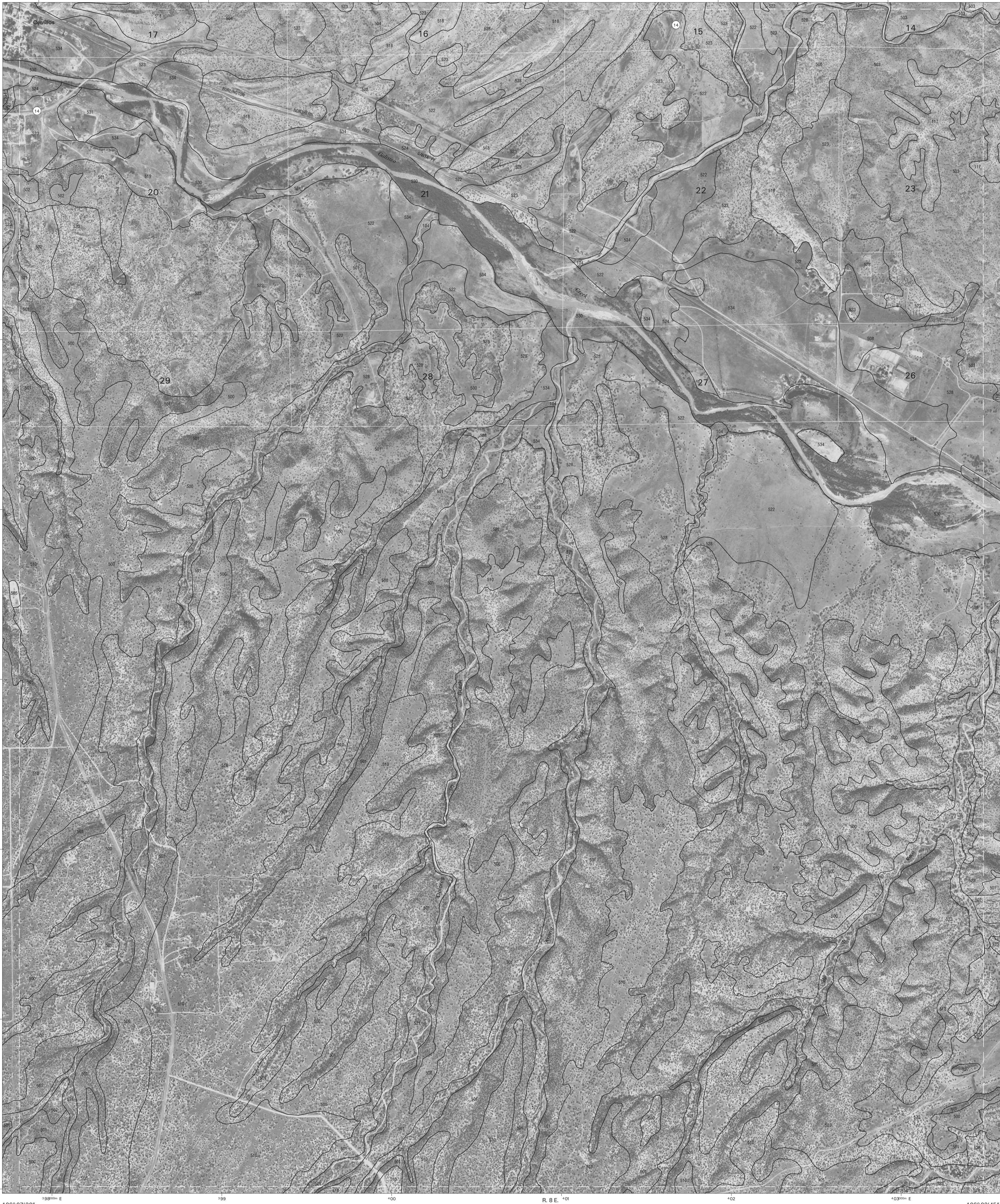
|    |    |    |    |                           |
|----|----|----|----|---------------------------|
| 51 | 52 | 53 | 51 | MADRID NW                 |
|    |    |    | 52 | MADRID NE                 |
|    |    |    | 53 | PICTURE ROCK NW           |
|    |    |    | 60 | MADRID SW                 |
|    |    |    | 62 | PICTURE ROCK SW           |
|    |    |    | 69 | GOLDEN NW                 |
|    |    |    | 70 | GOLDEN NE                 |
|    |    |    | 71 | CAPTAIN DAVIS MOUNTAIN NW |

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MADRID SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 61 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

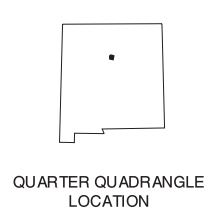




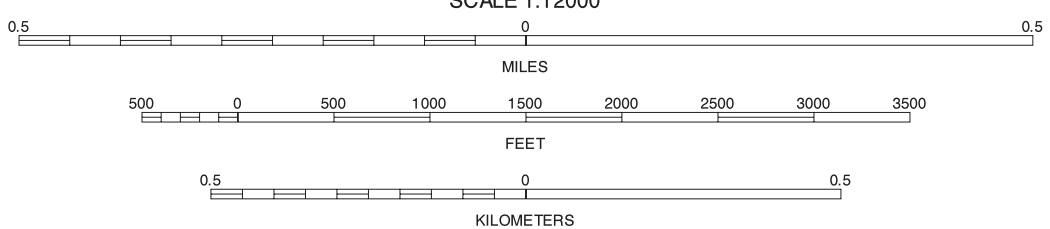
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                              |
|----|----|----|------------------------------|
| 52 | 53 | 54 | 52 MADRID NE                 |
|    |    |    | 53 PICTURE ROCK NW           |
|    |    |    | 54 PICTURE ROCK NE           |
| 61 |    | 63 | 61 MADRID SE                 |
|    |    |    | 63 PICTURE ROCK SE           |
|    |    |    | 70 GOLDEN NE                 |
| 70 | 71 | 72 | 71 CAPTAIN DAVIS MOUNTAIN NW |
|    |    |    | 72 CAPTAIN DAVIS MOUNTAIN NE |

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PICTURE ROCK SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 62 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.



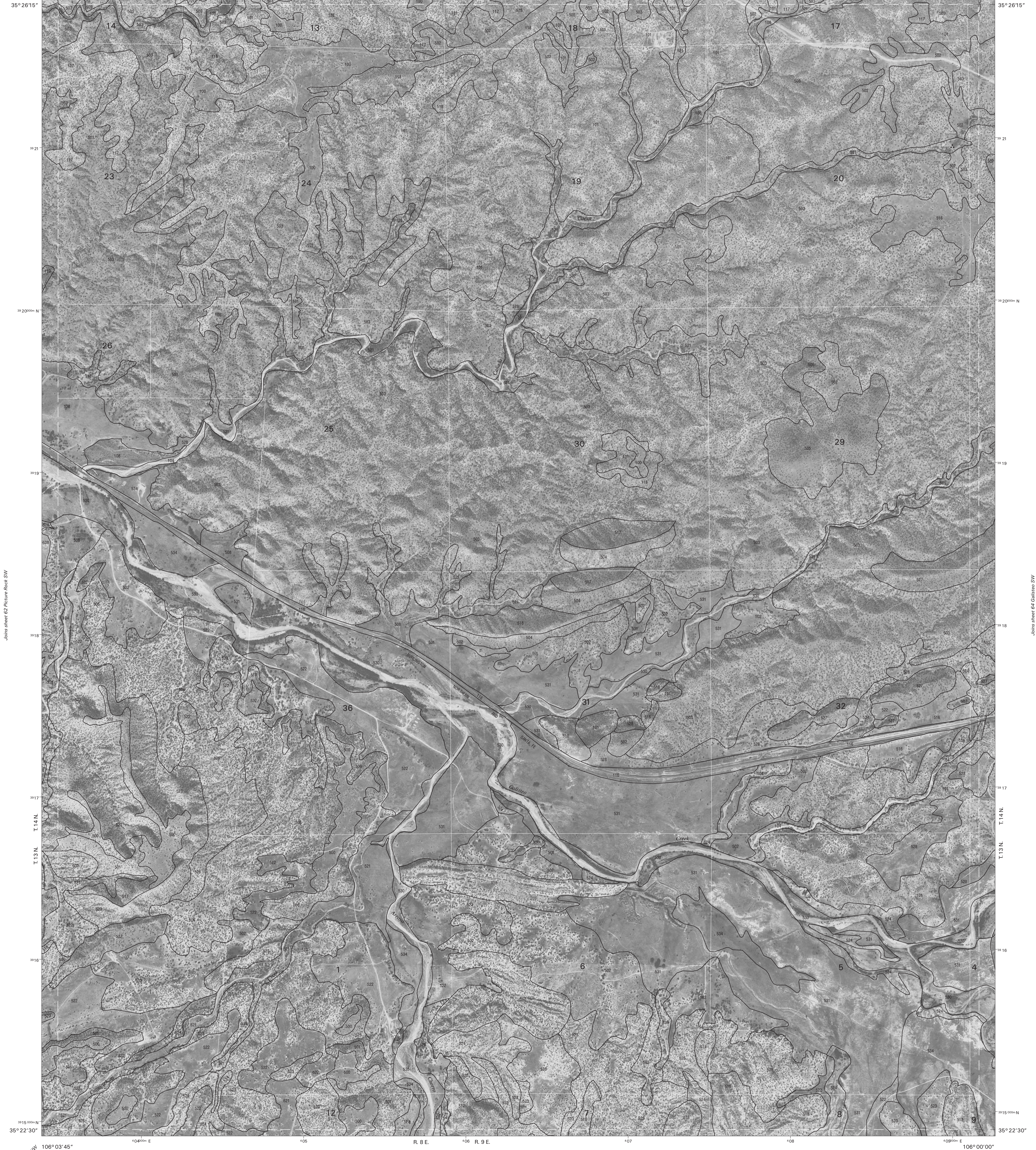
Joins sheet 53  
Picture Rock NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
106° 03' 45"

Joins sheet 54 Picture Rock NE

SANTA FE COUNTY AREA, NEW MEXICO  
PICTURE ROCK SE QUADRANGLE  
SHEET NUMBER 63 OF 122  
106° 00' 00"

Joins sheet 55  
Galisteo NW

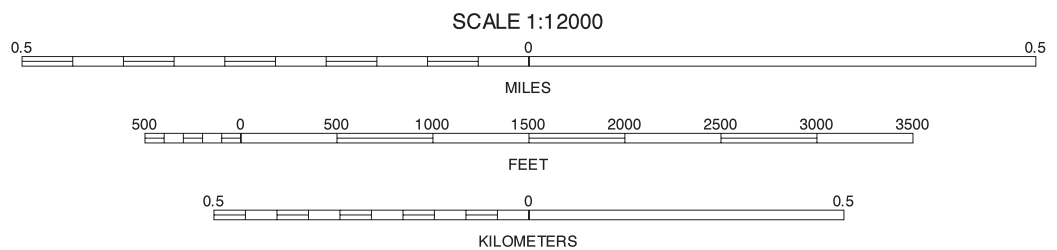


Joins sheet 71  
Captain Davis Mountain NW

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



Joins sheet 72 Captain Davis Mountain NE

|    |    |    |                              |
|----|----|----|------------------------------|
| 53 | 54 | 55 | 53 PICTURE ROCK NW           |
|    |    |    | 54 PICTURE ROCK NE           |
|    |    |    | 55 GALISTEO NW               |
| 62 |    | 64 | 62 PICTURE ROCK SW           |
|    |    |    | 64 GALISTEO SW               |
|    |    |    | 71 CAPTAIN DAVIS MOUNTAIN NW |
| 71 | 72 | 73 | 72 CAPTAIN DAVIS MOUNTAIN NE |
|    |    |    | 73 OJO HEDIONDA NW           |

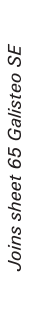
INDEX TO ADJOINING 3.75 MAPS

PICTURE ROCK SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 63 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

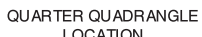
Joins sheet 73  
Ojo Hedionda NW





Joins sheet 72  
Captain Davis Mountain NE

NORTH

INDEX TO ADJOINING 3.75 MAPS

Joins sheet 74  
Ojo Hedionde NE

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Joins sheet 65  
Galisteo NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 56 Galisteo NE

SANTA FE COUNTY AREA, NEW MEXICO  
GALISTEO SE QUADRANGLE  
SHEET NUMBER 65 OF 122

Joins sheet 67  
Bull Canyon NW

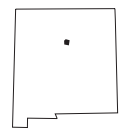


Joins sheet 73  
Ojo Hedionda NW

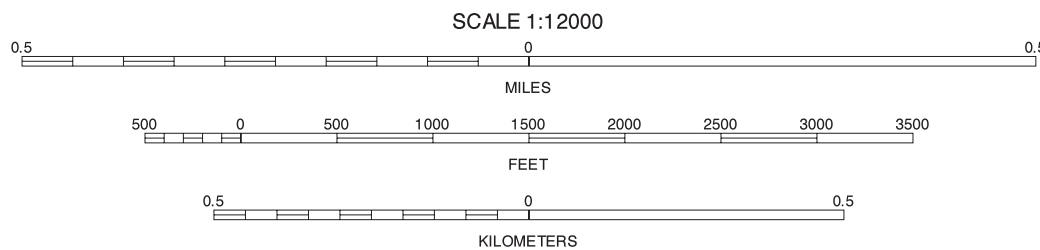
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 74 Ojo Hedionda NE

|    |    |    |                      |
|----|----|----|----------------------|
| 55 | 56 | 57 | 55 GALISTEO NW       |
|    |    |    | 56 GALISTEO NE       |
|    |    |    | 57 BULL CANYON NW    |
| 64 |    | 66 | 64 GALISTEO SW       |
|    |    |    | 66 BULL CANYON SW    |
|    |    |    | 73 OJO HEDIONDA NW   |
| 73 | 74 | 75 | 74 OJO HEDIONDA NE   |
|    |    |    | 75 WILDHORSE MESA NW |

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GALISTEO SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 65 OF 122

Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.

Joins sheet 66  
Bull Canyon SW



Joins sheet 66  
Galisteo NE

Joins sheet 68  
Bull Canyon NE



Joins sheet 65 Galisteo SE

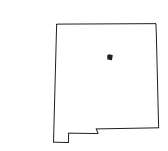
Joins sheet 67 Bull Canyon SE

Joins sheet 74  
On Indianola NE

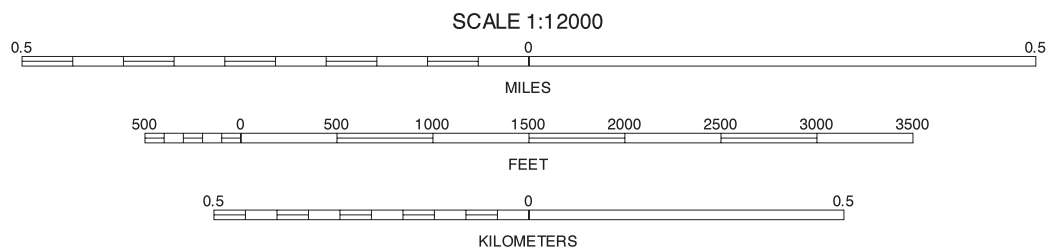
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 75 Wildhorse Mesa NW

|    |    |    |                      |
|----|----|----|----------------------|
| 56 | 57 | 58 | 56 GALISTEO NE       |
|    |    |    | 57 BULL CANYON NW    |
|    |    |    | 58 BULL CANYON NE    |
| 65 |    | 67 | 65 GALISTEO SE       |
|    |    |    | 67 BULL CANYON SE    |
|    |    |    | 74 OJO HEDIONDA NE   |
|    |    |    | 75 WILDHORSE MESA NW |
| 74 | 75 | 76 | 76 WILDHORSE MESA NE |

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BULL CANYON SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 66 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjoining map sheets.

Joins sheet 66  
Wildhorse Mesa NE



Soils sheet 57  
Bull Canyon NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105° 48' 45"

Joins sheet 58 Bull Canyon NE

SANTA FE COUNTY AREA, NEW MEXICO  
BULL CANYON SE QUADRANGLE  
SHEET NUMBER 67 OF 122  
105° 45' 00"

Joins sheet 69  
Rowe NW



Joins sheet 66 Bull Canyon SW

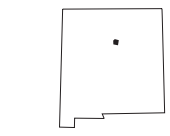
Joins sheet 68 Rowe SW

Joins sheet 75  
Wildhorse Mesa NW

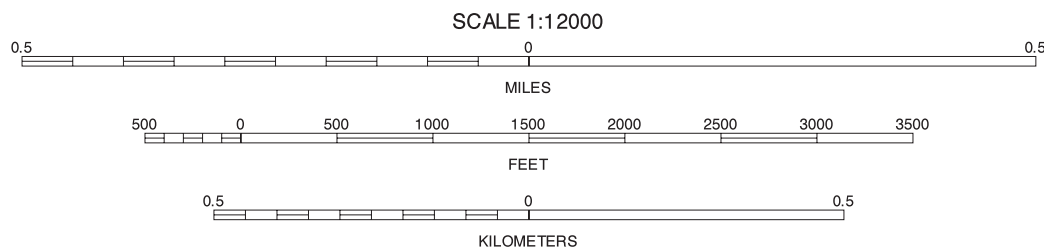
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |    |                   |
|----|----|----|----|-------------------|
| 57 | 58 | 59 | 57 | BULL CANYON NW    |
|    |    |    | 58 | BULL CANYON NE    |
|    |    |    | 59 | ROWE NW           |
| 66 |    | 68 | 66 | BULL CANYON SW    |
|    |    |    | 68 | ROWE SW           |
|    |    |    | 75 | WILDHORSE MESA NW |
|    |    |    | 76 | WILDHORSE MESA NE |
| 75 | 76 | 77 | 77 | RENCONA NW        |

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BULL CANYON SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 67 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

Joins sheet 77  
Rencona NW

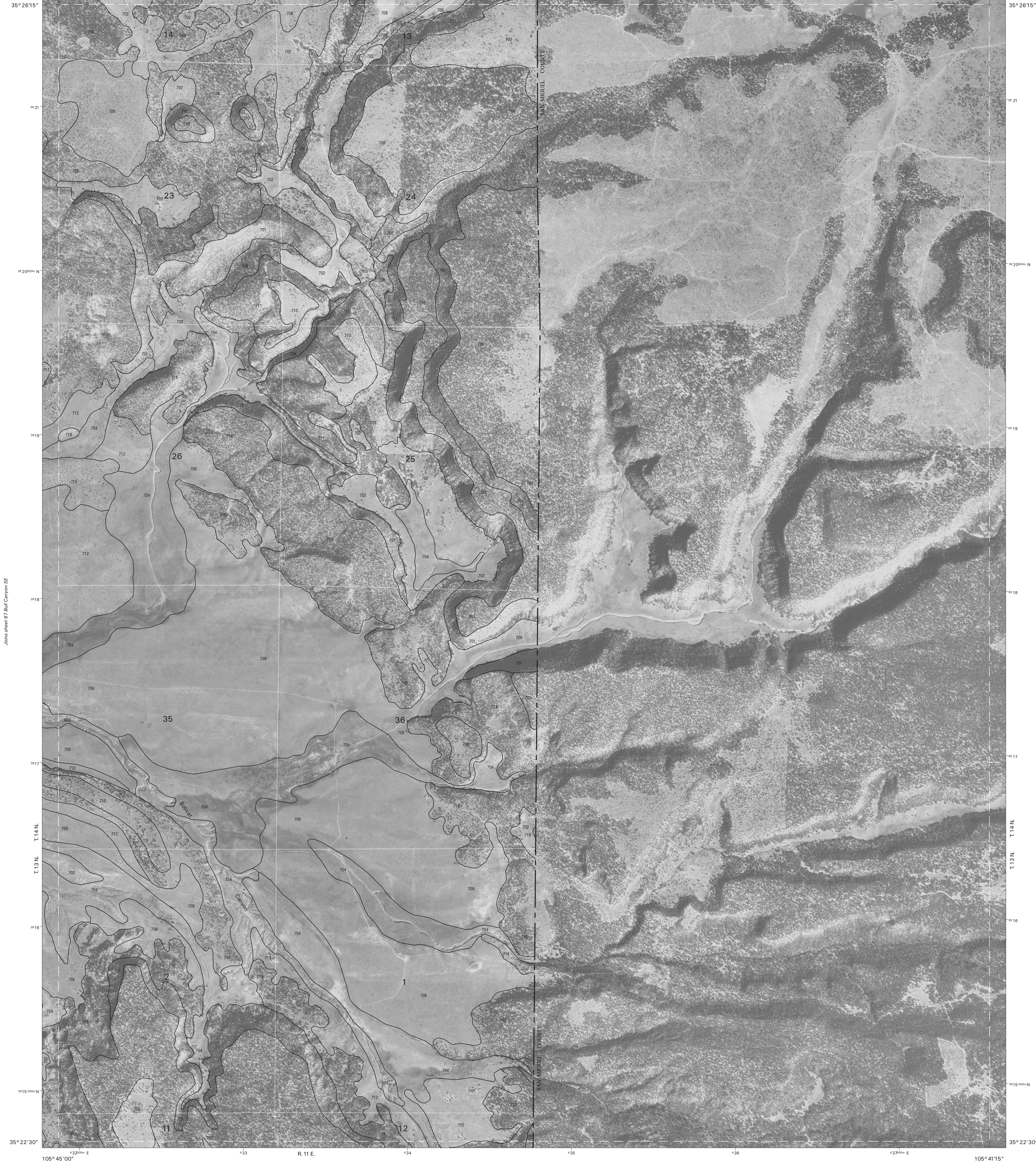


Joins sheet 69  
Bull Canyon NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 59 Rowe NW

SANTA FE COUNTY AREA, NEW MEXICO  
ROWE SW QUADRANGLE  
SHEET NUMBER 68 OF 122



Joins sheet 67 Bull Canyon SE

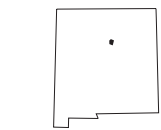
Joins sheet 76  
Wildhorse Mesa NE

Joins sheet 77 Rencona NW

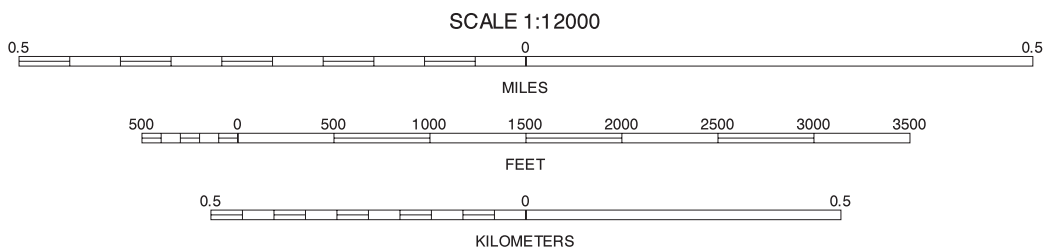
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



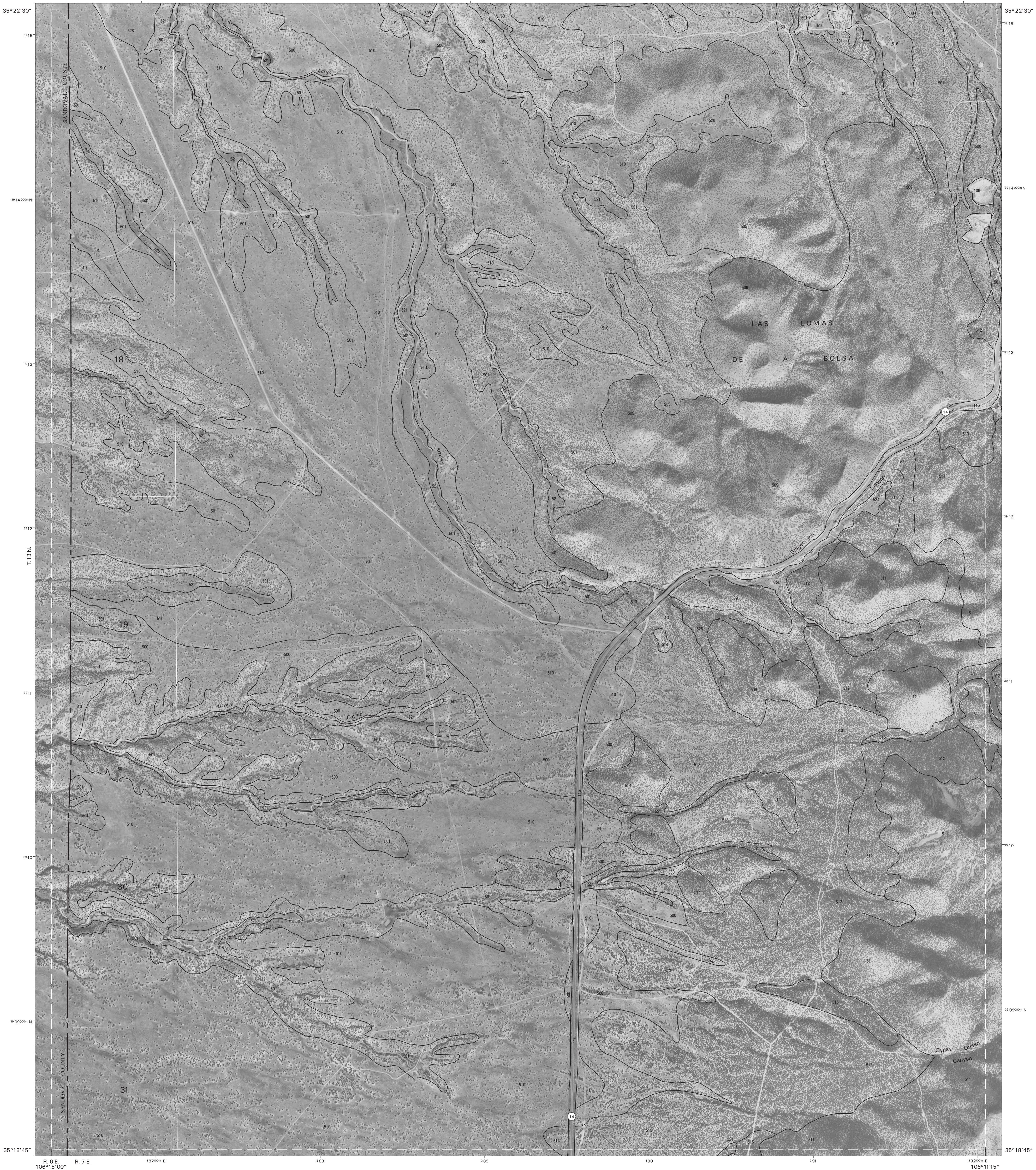
|    |    |  |                                                            |
|----|----|--|------------------------------------------------------------|
| 58 | 59 |  | 58 BULL CANYON NE<br>59 ROWE NW                            |
| 67 |    |  | 67 BULL CANYON SE<br>76 WILDHORSE MESA NE<br>77 RENCONA NW |
| 76 | 77 |  |                                                            |

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ROWE SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 68 OF 122

Soil map delineations extending beyond the dashed white quadrangle headline are for reference only and are included on adjacent map sheets.

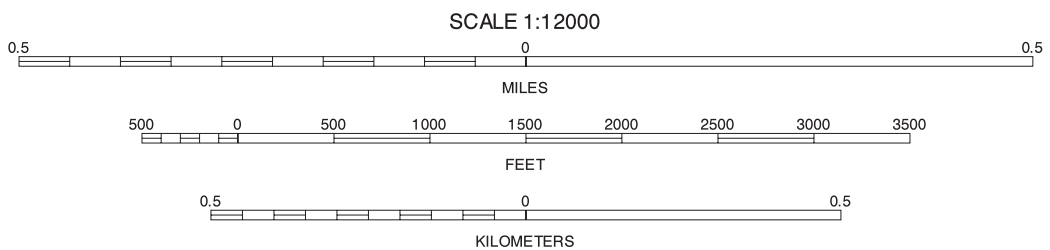
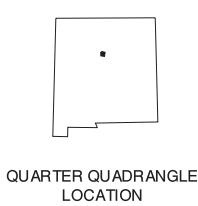




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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



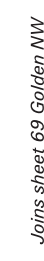
|  |    |    |    |           |
|--|----|----|----|-----------|
|  | 60 | 61 | 60 | MADRID SW |
|  |    |    | 61 | MADRID SE |
|  |    | 70 | 70 | GOLDEN NE |
|  | 78 | 79 | 78 | GOLDEN SW |
|  |    |    | 79 | GOLDEN SE |

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GOLDEN NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 69 OF 122

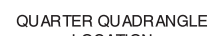
Soil map delineations extending beyond the dashed white quadrangle heatine are for reference only and are included on adjacent map sheets.





Joins sheet 78  
Golden SW

NORTH

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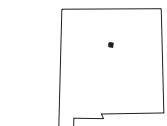
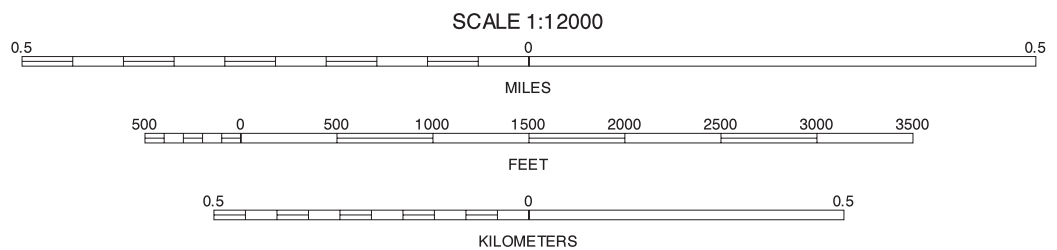
Joins sheet 80  
Captain Davis Mountain SW

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.





North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE  
157551

|    |    |    |                              |
|----|----|----|------------------------------|
| 61 | 62 | 63 | 61 MADRID SE                 |
|    |    |    | 62 PICTURE ROCK SW           |
|    |    |    | 63 PICTURE ROCK SE           |
| 70 |    | 72 | 70 GOLDEN NE                 |
|    |    |    | 72 CAPTAIN DAVIS MOUNTAIN NE |
|    |    |    | 79 GOLDEN SE                 |
| 79 | 80 | 81 | 80 CAPTAIN DAVIS MOUNTAIN SW |
|    |    |    | 81 CAPTAIN DAVIS MOUNTAIN SE |

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CAPTAIN DAVIS MOUNTAIN NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 71 OF 100

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.









Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 83  
Ojo Hedionda SE



Joins sheet 64  
Galisteo SW

Joins sheet 65 Galisteo SE

Joins sheet 66  
Bull Canyon SW

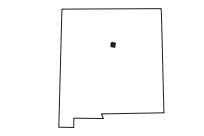


Joins sheet 62  
Ojo Hedionda SW

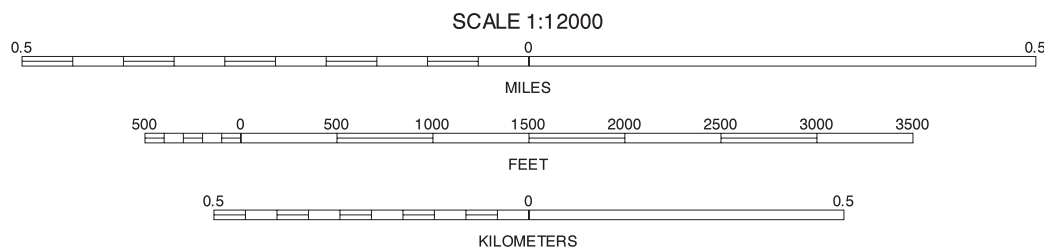
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 83 Ojo Hedionda SE

|    |    |    |                      |
|----|----|----|----------------------|
| 64 | 65 | 66 | 64 GALISTEO SW       |
|    |    |    | 65 GALISTEO SE       |
|    |    |    | 66 BULL CANYON SW    |
| 73 |    | 75 | 73 OJO HEDIONDA NW   |
|    |    |    | 75 WILDHORSE MESA NW |
|    |    |    | 82 OJO HEDIONDA SW   |
| 82 | 83 | 84 | 83 OJO HEDIONDA SE   |
|    |    |    | 84 WILDHORSE MESA SW |

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OJO HEDIONDA NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 74 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.

Joins sheet 64  
Wildhorse Mesa SW



Joins sheet 65  
Galisteo SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105° 52' 30"

Joins sheet 66 Bull Canyon SW

SANTA FE COUNTY AREA, NEW MEXICO  
WILDHORSE MESA NW QUADRANGLE  
SHEET NUMBER 75 OF 122  
105° 48' 45"

Joins sheet 65  
Bull Canyon SE

Joins sheet 74 Ojo Hiedionda NE

Joins sheet 76 Wildhorse Mesa NE

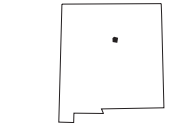
Joins sheet 63  
Ojo Hiedionda SE

Joins sheet 65  
Wildhorse Mesa SE

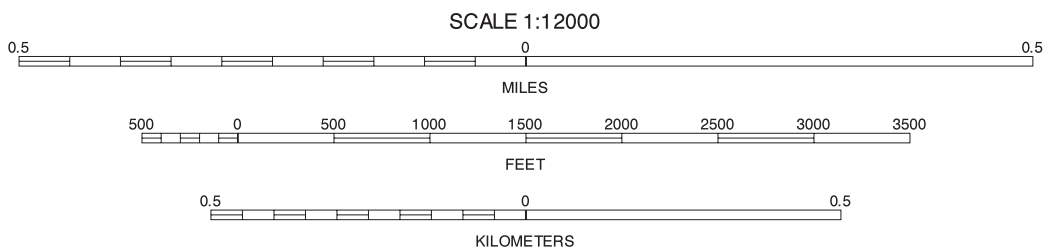
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                      |
|----|----|----|----------------------|
| 65 | 66 | 67 | 65 GALISTEO SE       |
|    |    |    | 66 BULL CANYON SW    |
|    |    |    | 67 BULL CANYON SE    |
| 74 |    | 76 | 74 OJO HIEDIONDA NE  |
|    |    |    | 75 WILDHORSE MESA NE |
|    |    |    | 83 OJO HIEDIONDA SE  |
| 83 | 84 | 85 | 84 WILDHORSE MESA SW |
|    |    |    | 85 WILDHORSE MESA SE |

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WILDHORSE MESA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 75 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.



Joins sheet 66  
Bull Canyon SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105° 48' 45"

Joins sheet 67 Bull Canyon SE

SANTA FE COUNTY AREA, NEW MEXICO  
WILDHORSE MESA NE QUADRANGLE  
SHEET NUMBER 76 OF 122  
105° 45' 00"

Joins sheet 68  
Rowe SW



Joins sheet 75 Wildhorse Mesa NW

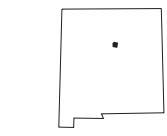
Joins sheet 77 Rencoma NW

Joins sheet 64  
Wildhorse Mesa SW

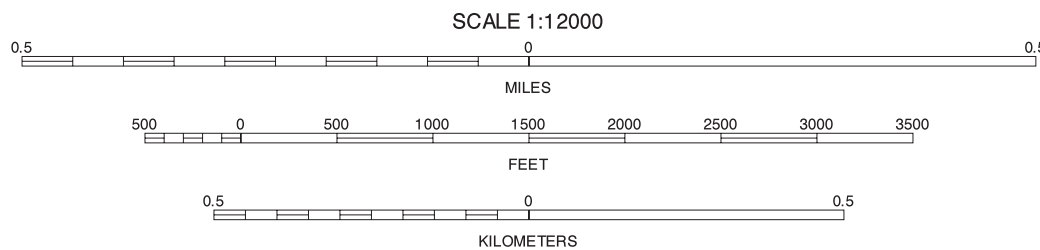
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 85 Wildhorse Mesa SE

|    |    |    |
|----|----|----|
| 66 | 67 | 68 |
| 75 | 77 |    |
| 84 | 85 | 86 |

INDEX TO ADJOINING 3.75 MAPS

|    |                   |
|----|-------------------|
| 66 | BULL CANYON SW    |
| 67 | BULL CANYON SE    |
| 68 | ROWE SW           |
| 75 | WILDHORSE MESA NW |
| 77 | RENCOMA NW        |
| 84 | WILDHORSE MESA SW |
| 85 | WILDHORSE MESA SE |
| 86 | RENCOMA SW        |

WILDHORSE MESA NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 76 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.

Joins sheet 86  
Rencoma SW



Joins sheet 67  
Bull Canyon SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 68 Rowe SW

SANTA FE COUNTY AREA, NEW MEXICO  
RENCONA NW QUADRANGLE  
SHEET NUMBER 77 OF 122



Joins sheet 76 Wildhorse Mesa NE

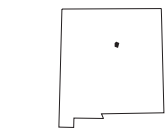
Joins sheet 85  
Wildhorse Mesa SE

Joins sheet 86 Rencona SW

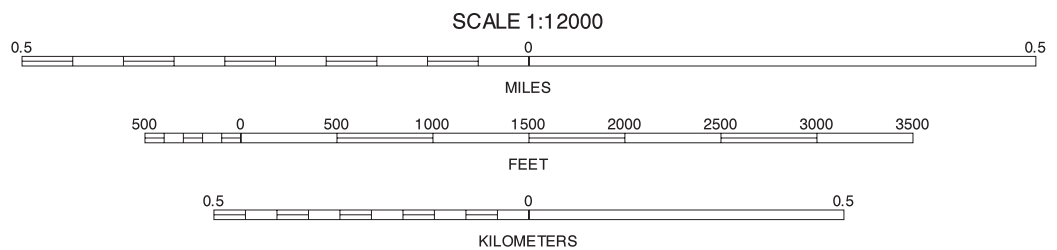
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



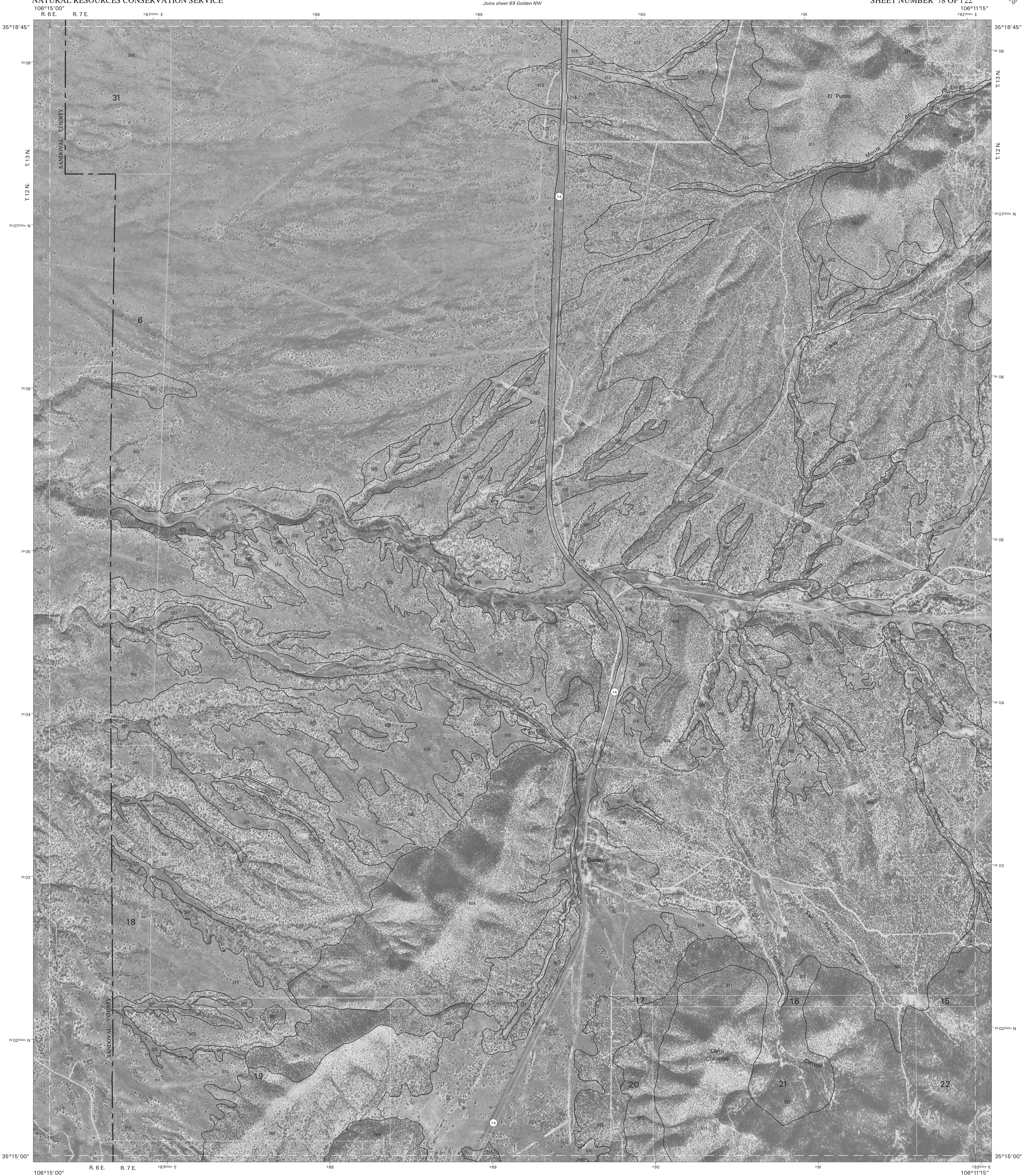
|    |    |                                                               |
|----|----|---------------------------------------------------------------|
| 67 | 68 | 67 BULL CANYON SE<br>68 ROWE SW                               |
| 76 |    | 76 WILDHORSE MESA NE<br>85 WILDHORSE MESA SE<br>86 RENCONA SW |
| 85 | 86 |                                                               |

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RENCONA NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 77 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

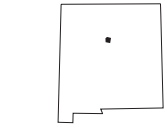




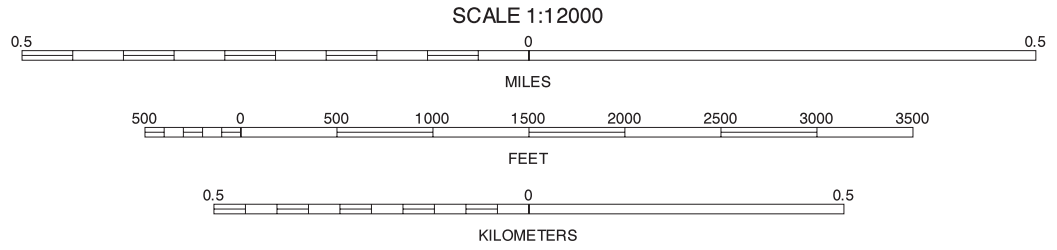
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |           |    |              |
|----|-----------|----|--------------|
| 69 | 70        | 69 | GOLDEN NW    |
| 70 | GOLDEN NE |    |              |
| 79 | GOLDEN SE |    |              |
| 87 | 88        | 87 | SAN PEDRO NW |
|    |           | 88 | SAN PEDRO NE |

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GOLDEN SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 78 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 69  
Golden NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

SANTA FE COUNTY AREA, NEW MEXICO  
GOLDEN SE QUADRANGLE  
SHEET NUMBER 79 OF 122

Joins sheet 77  
Captain Davis Mountain NW



Joins sheet 76 Golden SW

Joins sheet 80 Captain Davis Mountain SW

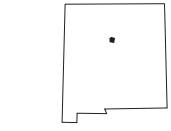
Joins sheet 87  
San Pedro NW

Joins sheet 89  
King Draw NW

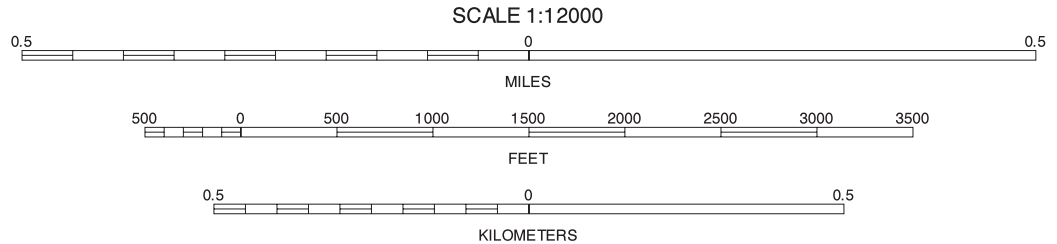
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |    |                           |
|----|----|----|----|---------------------------|
| 69 | 70 | 71 | 69 | GOLDEN NW                 |
|    |    |    | 70 | GOLDEN NE                 |
|    |    |    | 71 | CAPTAIN DAVIS MOUNTAIN NW |
| 78 |    | 80 | 78 | GOLDEN SW                 |
|    |    |    | 80 | CAPTAIN DAVIS MOUNTAIN SW |
|    |    |    | 87 | SAN PEDRO NW              |
|    |    |    | 88 | SAN PEDRO NE              |
| 87 | 88 | 89 | 89 | KING DRAW NW              |

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GOLDEN SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 79 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.



Joins sheet 70  
Golden NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
106° 07' 30"

Joins sheet 71 Captain Davis Mountain NW

SANTA FE COUNTY AREA, NEW MEXICO  
CAPTAIN DAVIS MOUNTAIN SW QUADRANGLE  
SHEET NUMBER 80 OF 122  
106° 03' 45"

Joins sheet 72  
Captain Davis Mountain NE

Joins sheet 79 Golden SE

Joins sheet 81 Captain Davis Mountain SE

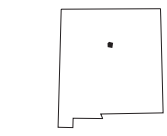
Joins sheet 88  
King Draw NE

Joins sheet 90  
King Draw NE

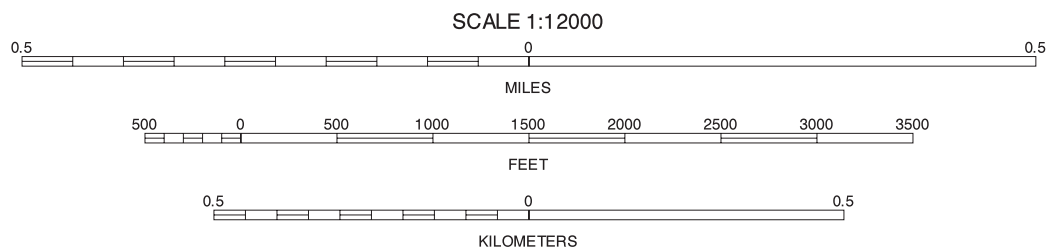
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                              |
|----|----|----|------------------------------|
| 70 | 71 | 72 | 70 GOLDEN NE                 |
|    |    |    | 71 CAPTAIN DAVIS MOUNTAIN NW |
|    |    |    | 72 CAPTAIN DAVIS MOUNTAIN NE |
| 79 |    | 81 | 79 GOLDEN SE                 |
|    |    |    | 81 CAPTAIN DAVIS MOUNTAIN SE |
|    |    |    | 88 SAN PEDRO NE              |
|    |    |    | 89 KING DRAW NW              |
| 88 | 89 | 90 | 90 KING DRAW NE              |

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CAPTAIN DAVIS MOUNTAIN SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 80 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.

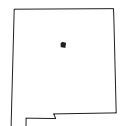




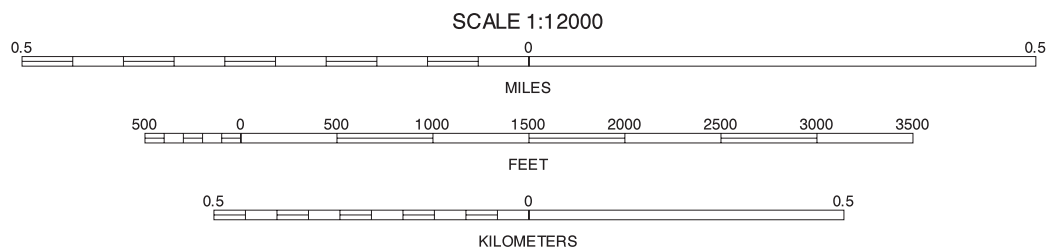
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 71 | 72 | 73 |
| 80 | 81 | 82 |
| 89 | 90 | 91 |

INDEX TO ADJOINING 3.75 MAPS

CAPTAIN DAVIS MOUNTAIN SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 81 OF 122

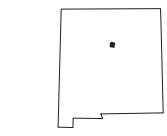
Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



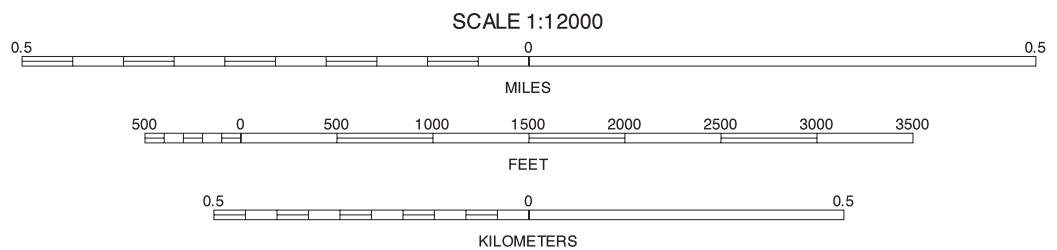
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |                              |
|----|----|----|------------------------------|
| 72 | 73 | 74 | 72 CAPTAIN DAVIS MOUNTAIN NE |
|    |    |    | 73 OJO HEDIONDA NW           |
|    |    |    | 74 OJO HEDIONDA NE           |
| 81 |    | 83 | 81 CAPTAIN DAVIS MOUNTAIN SE |
|    |    |    | 83 OJO HEDIONDA SE           |
|    |    |    | 90 KING DRAW NE              |
|    |    |    | 91 STANLEY NW                |
| 90 | 91 | 92 | 92 STANLEY NE                |

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OJO HEDIONDA SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 82 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 73  
Ojo Hedionda NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105°56'15"

Joins sheet 74 Ojo Hedionda NE

SANTA FE COUNTY AREA, NEW MEXICO  
OJO HEDIONDA SE QUADRANGLE  
SHEET NUMBER 83 OF 122  
105°52'30"

Joins sheet 75  
Wildhorse Mesa NW

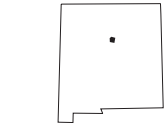


Joins sheet 91  
Stanley NW

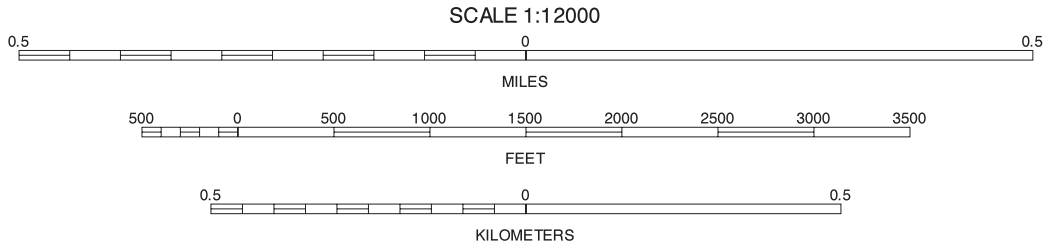
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 92 Stanley NE

|    |    |    |    |                   |
|----|----|----|----|-------------------|
| 73 | 74 | 75 | 73 | OJO HEDIONDA NW   |
|    |    |    | 74 | OJO HEDIONDA NE   |
|    |    |    | 75 | WILDHORSE MESA NW |
| 82 |    | 84 | 82 | OJO HEDIONDA SW   |
|    |    |    | 84 | WILDHORSE MESA SW |
|    |    |    | 91 | STANLEY NW        |
| 91 | 92 | 93 | 92 | STANLEY NE        |
|    |    |    | 93 | WHITE LAKES NW    |

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OJO HEDIONDA SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 83 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

Joins sheet 93  
White Lake NW



Joins sheet 74  
Ojo Hedionda NE

Joins sheet 76  
Wildhorse Mesa NE

Joins sheet 75 Wildhorse Mesa NW



Joins sheet 83 Ojo Hedionda SE

Joins sheet 85 Wildhorse Mesa SE

Joins sheet 92  
Stanley NE

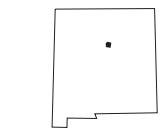
Joins sheet 94  
White Lakes NE

Joins sheet 93 White Lakes NW

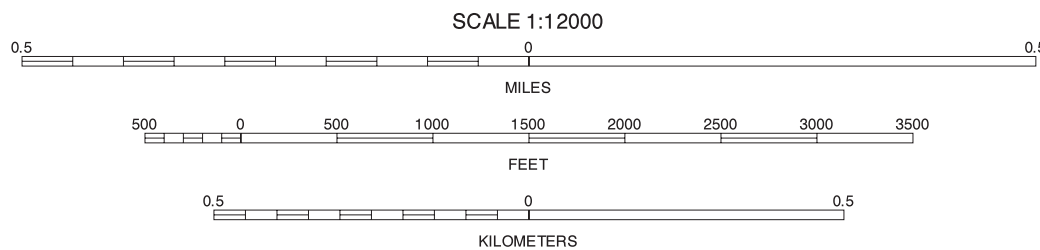
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |    |
|----|----|----|----|
| 74 | 75 | 76 | 74 |
| 83 | 85 | 86 | 83 |
| 92 | 93 | 94 | 92 |

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WILDHORSE MESA SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 84 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.



Joins sheet 75  
Wildhorse Mesa NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105° 48' 45"

Joins sheet 76 Wildhorse Mesa NE

SANTA FE COUNTY AREA, NEW MEXICO  
WILDHORSE MESA SE QUADRANGLE  
SHEET NUMBER 85 OF 122  
105° 45' 00"

Joins sheet 77  
Rinconona NW



Joins sheet 84 Wildhorse Mesa SW

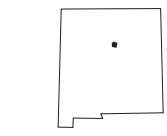
Joins sheet 86 Rinconona SW

Joins sheet 93  
White Lakes NW

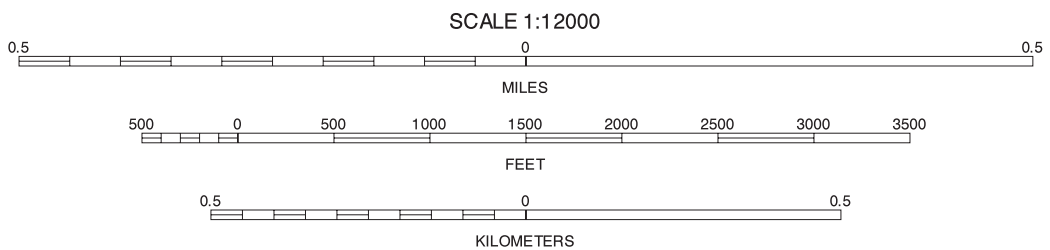
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 94 White Lakes NE

|    |    |    |                      |
|----|----|----|----------------------|
| 75 | 76 | 77 | 75 WILDHORSE MESA NW |
|    |    |    | 76 WILDHORSE MESA NE |
|    |    |    | 77 RINCONONA NW      |
| 84 |    | 86 | 84 WILDHORSE MESA SW |
|    |    |    | 86 RINCONONA SW      |
|    |    |    | 93 WHITE LAKES NW    |
|    |    |    | 94 WHITE LAKES NE    |
| 93 | 94 | 95 | 95 MESAL TORO NW     |

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WILDHORSE MESA SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 85 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.

Joins sheet 96  
Mesa El Toro NW



Joins sheet 76  
Wildhorse Mesa NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105° 45' 00"      +320000 E      +33      +34      R. 11 E.      R. 12 E.      +35      +36      +370000 E      105° 41' 15"

SANTA FE COUNTY AREA, NEW MEXICO  
RENCONA SW QUADRANGLE  
SHEET NUMBER 86 OF 122

Joins sheet 77 Rencona NW

Joins sheet 85 Wildhorse Mesa SE

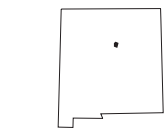
Joins sheet 94  
White Lakes NE



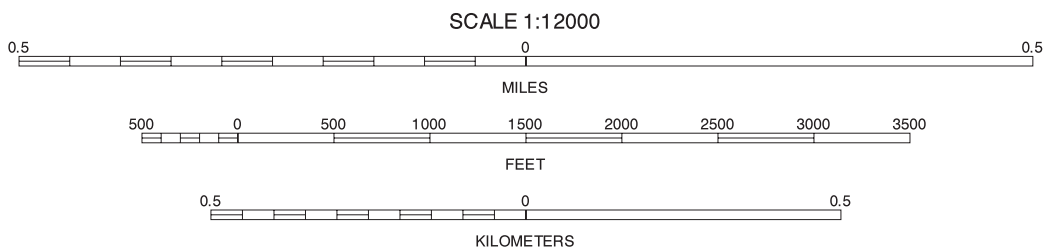
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |    |    |
|----|----|----|----|
| 76 | 77 | 78 | 79 |
| 85 | 86 | 87 | 88 |
| 94 | 95 | 96 | 97 |

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RENCONA SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 86 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

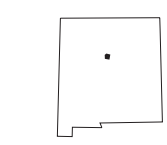




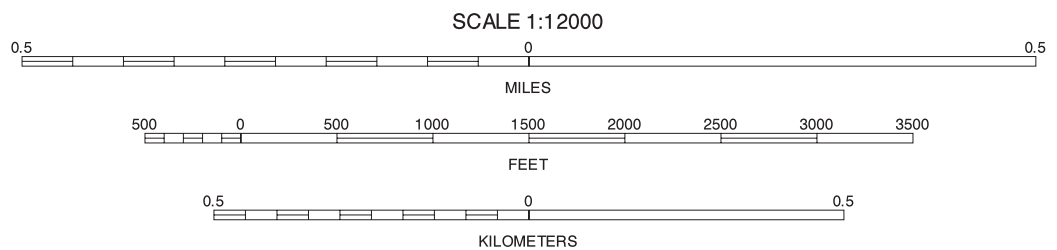
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|  |    |    |    |              |
|--|----|----|----|--------------|
|  | 78 | 79 | 78 | GOLDEN SW    |
|  |    |    | 79 | GOLDEN SE    |
|  |    | 88 | 88 | SAN PEDRO NE |
|  | 96 | 97 | 96 | SAN PEDRO SW |
|  |    |    | 97 | SAN PEDRO SE |

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SAN PEDRO NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 87 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

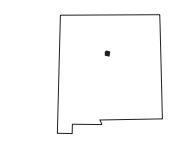




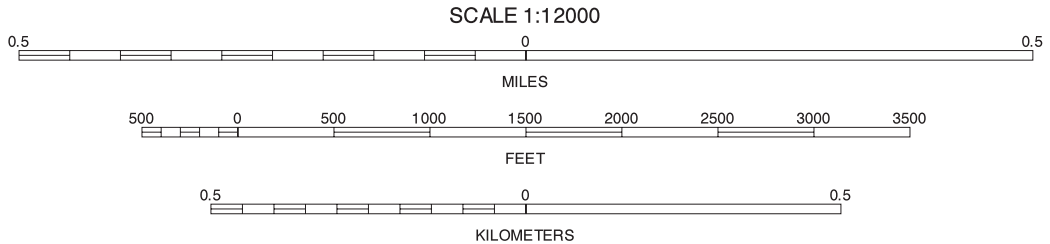
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |                                 |                    |
|----|----|---------------------------------|--------------------|
| 78 | 79 | 80                              | 78<br>GOLDEN SW    |
| 87 | 89 | 80<br>CAPTAIN DAVIS MOUNTAIN SW | 87<br>SAN PEDRO NW |
| 96 | 97 | 98<br>KING DRAW SW              | 89<br>KING DRAW NW |

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SAN PEDRO NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 88 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 79  
Golden Sp.

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
106° 07' 30"

Joins sheet 80 Captain Davis Mountain SW

SANTA FE COUNTY AREA, NEW MEXICO  
KING DRAW NW QUADRANGLE  
SHEET NUMBER 89 OF 122  
106° 03' 45"

Joins sheet 81  
Captain Davis Mountain SE



Joins sheet 88 San Pedro NE

Joins sheet 90 King Draw NE

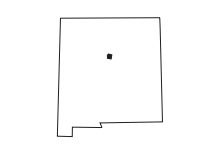
Joins sheet 97  
San Pedro SE

Joins sheet 99  
King Draw SE

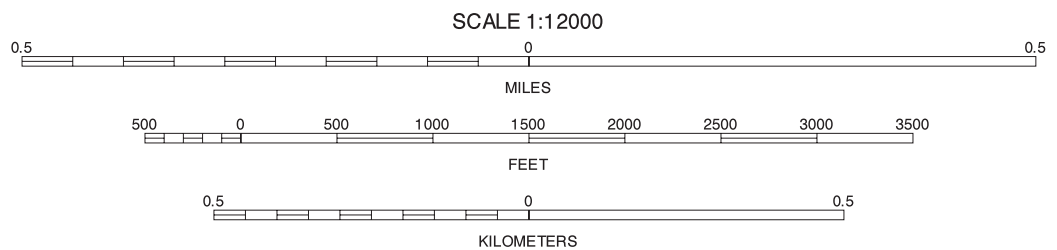
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|    |    |    |
|----|----|----|
| 79 | 80 | 81 |
| 88 | 89 | 90 |
| 97 | 98 | 99 |

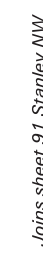
79 GOLDEN SE  
80 CAPTAIN DAVIS MOUNTAIN SW  
81 CAPTAIN DAVIS MOUNTAIN SE  
88 SAN PEDRO NE  
89 KING DRAW NW  
90 SAN PEDRO SE  
97 KING DRAW SW  
98 KING DRAW SE  
99 KING DRAW SE

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KING DRAW NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 89 OF 122

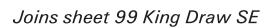
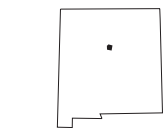
Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.





Joins sheet 98  
King Draw SW

Joins sheet 98  
King Draw SW

INDEX TO ADJOINING 3,75 MAPS

Joins sheet 100  
Stanley SW

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



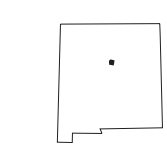
Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.



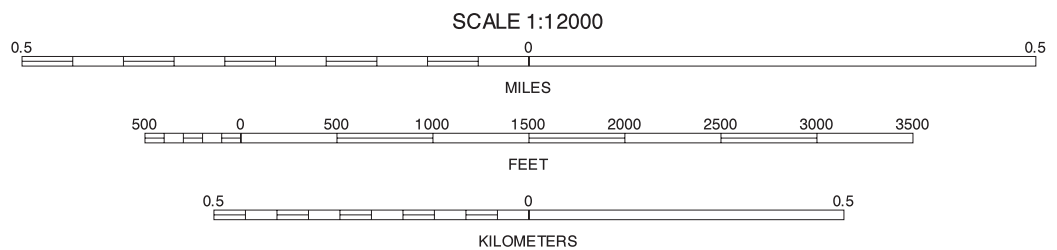
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|    |    |    |    |                           |
|----|----|----|----|---------------------------|
| 81 | 82 | 83 | 81 | CAPTAIN DAVIS MOUNTAIN SE |
| 82 | 83 | 84 | 82 | OJO HEDIONDA SW           |
| 83 | 84 | 85 | 83 | OJO HEDIONDA SE           |
| 84 | 85 | 86 | 84 | KING DRAW NE              |
| 85 | 86 | 87 | 85 | STANLEY NE                |
| 86 | 87 | 88 | 86 | KING DRAW SE              |
| 87 | 88 | 89 | 87 | 100 STANLEY SW            |
| 88 | 89 | 90 | 88 | 101 STANLEY SE            |

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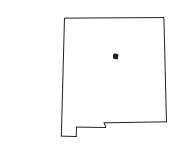




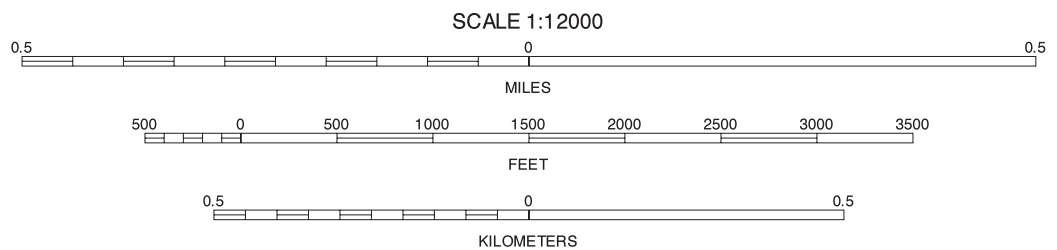
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                      |
|-----|-----|-----|----------------------|
| 82  | 83  | 84  | 82 OJO HEDIONDA SW   |
|     |     |     | 83 OJO HEDIONDA SE   |
|     |     |     | 84 WILDHORSE MESA SW |
| 91  |     | 93  | 91 STANLEY NW        |
|     |     |     | 92 WHITE LAKES NW    |
|     |     |     | 100 STANLEY SW       |
|     |     |     | 101 STANLEY SE       |
| 100 | 101 | 102 | 102 WHITE LAKES SW   |

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STANLEY NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 92 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 83  
Ojo Hedi'onda SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105°52'30"

Joins sheet 84 Wildhorse Mesa SW

SANTA FE COUNTY AREA, NEW MEXICO  
WHITE LAKES NW QUADRANGLE  
SHEET NUMBER 93 OF 122  
105°48'45"

Joins sheet 85  
Wildhorse Mesa SE

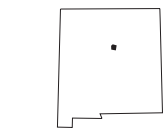


Joins sheet 101  
Swain Hill SE

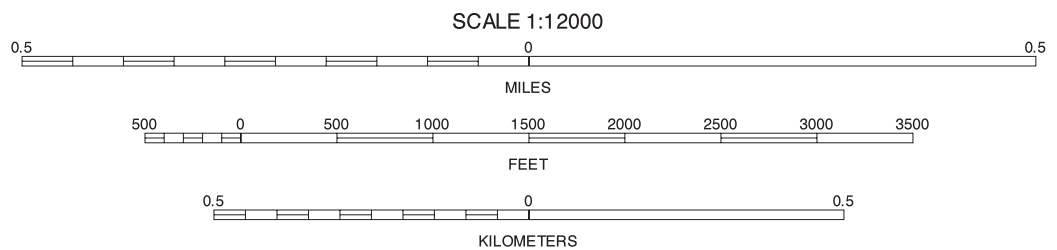
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 102 White Lakes SW

|     |     |     |                      |
|-----|-----|-----|----------------------|
| 83  | 84  | 85  | 83 OJO HEDI'ONDA SE  |
|     |     |     | 84 WILDHORSE MESA SW |
|     |     |     | 85 WILDHORSE MESA SE |
| 92  |     | 94  | 82 STANLEY NE        |
|     |     |     | 94 WHITE LAKES NE    |
|     |     |     | 101 STANLEY SE       |
| 101 | 102 | 103 | 102 WHITE LAKES SW   |
|     |     |     | 103 WHITE LAKES SE   |

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WHITE LAKES NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 93 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.

Joins sheet 102  
White Lakes SW



Joins sheet 84  
Wildhorse Mesa SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 85  
Wildhorse Mesa SE

SANTA FE COUNTY AREA, NEW MEXICO  
WHITE LAKES NE QUADRANGLE  
SHEET NUMBER 94 OF 122

Joins sheet 86  
Patonoma SW

Joins sheet 93  
White Lakes NW

Joins sheet 95  
Mesa El Toro NW

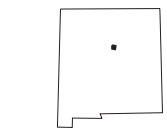
Joins sheet 102  
White Lakes SW

Joins sheet 104  
Mesa El Toro SW

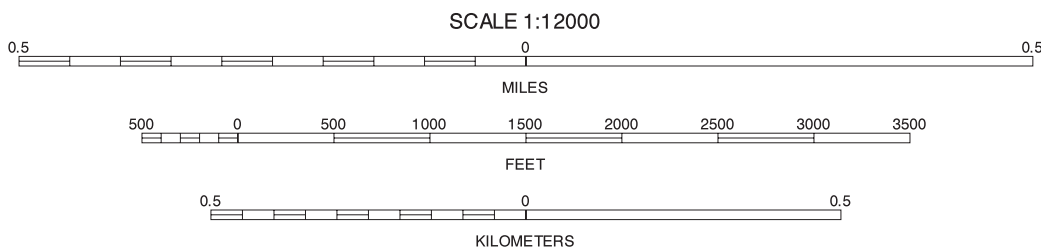
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |     |                   |
|-----|-----|-----|-----|-------------------|
| 84  | 85  | 86  | 84  | WILDHORSE MESA SW |
|     |     |     | 85  | WILDHORSE MESA SE |
|     |     |     | 86  | RENCONA SW        |
| 93  |     | 95  | 93  | WHITE LAKES NW    |
|     |     |     | 95  | MESA EL TORO NW   |
|     |     |     | 102 | WHITE LAKES SW    |
| 102 | 103 | 104 | 103 | WHITE LAKES SE    |
|     |     |     | 104 | MESA EL TORO SW   |

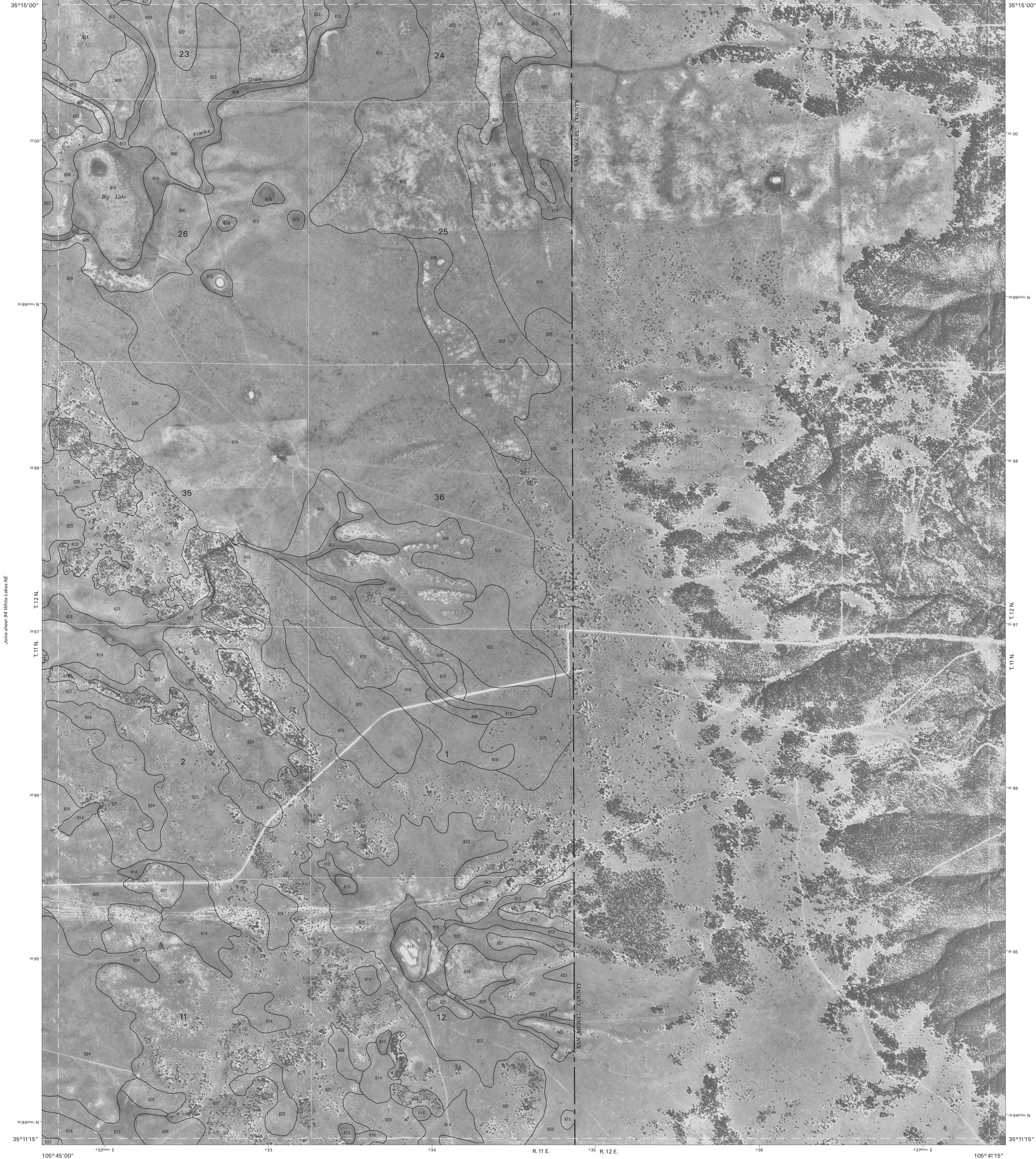
INDEX TO ADJOINING 3.75 MAPS

WHITE LAKES NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 94 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 85  
Wildhorse Mesa SE

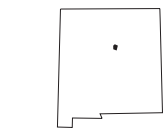


Joins sheet 103  
White Lakes SE

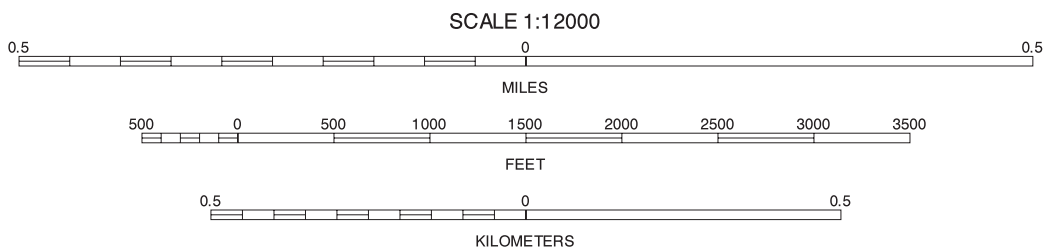
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |                                                                |
|-----|-----|----------------------------------------------------------------|
| 85  | 86  | 85 WILDHORSE MESA SE<br>86 RENCONA SW                          |
| 94  |     | 94 WHITE LAKES NE<br>103 WHITE LAKES SE<br>104 MESA EL TORO SW |
| 103 | 104 |                                                                |

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MESA EL TORO NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 95 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjoining map sheets.

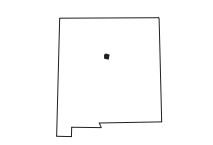




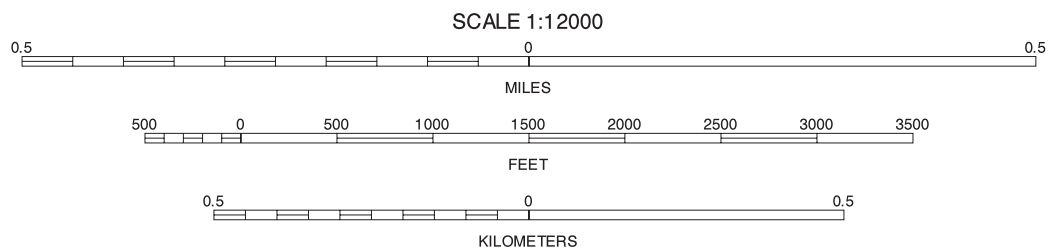
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|     |     |     |              |
|-----|-----|-----|--------------|
| 87  | 88  | 87  | SAN PEDRO NW |
|     |     | 88  | SAN PEDRO NE |
|     | 97  | 97  | SAN PEDRO SE |
| 105 | 106 | 105 | EDGEWOOD NW  |
|     |     | 106 | EDGEWOOD NE  |

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SAN PEDRO SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 96 OF 122

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.



Joins sheet 92  
San Pedro NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 88 San Pedro NE

SANTA FE COUNTY AREA, NEW MEXICO  
SAN PEDRO SE QUADRANGLE  
SHEET NUMBER 97 OF 122

Joins sheet 89  
King Draw NW





Joins sheet 88  
San Pedro NE

Joins sheet 89 King Draw NW

Joins sheet 90  
King Draw NE

Joins sheet 97 San Pedro SE

Joins sheet 99 King Draw SE

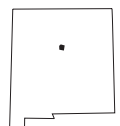
Joins sheet 106  
Edgewood NE

Joins sheet 108  
Moriarty North NE

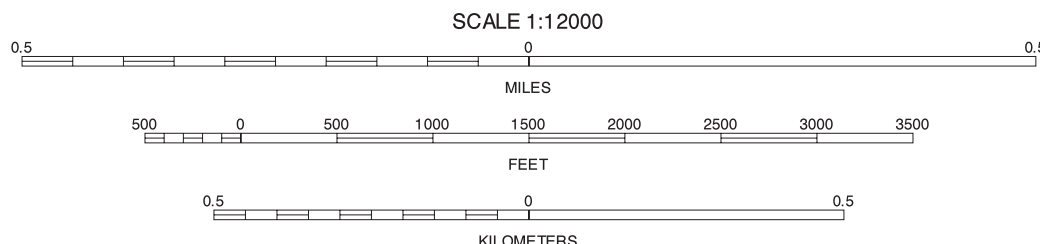
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                       |
|-----|-----|-----|-----------------------|
| 88  | 89  | 90  | 88 SAN PEDRO NE       |
|     |     |     | 89 KING DRAW NW       |
|     |     |     | 90 KING DRAW NE       |
| 97  |     | 99  | 97 SAN PEDRO SE       |
|     |     |     | 99 KING DRAW SE       |
|     |     |     | 106 EDGEWOOD NE       |
| 106 | 107 | 108 | 107 MORIARTY NORTH NW |
|     |     |     | 108 MORIARTY NORTH NE |

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KING DRAW SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 98 OF 122

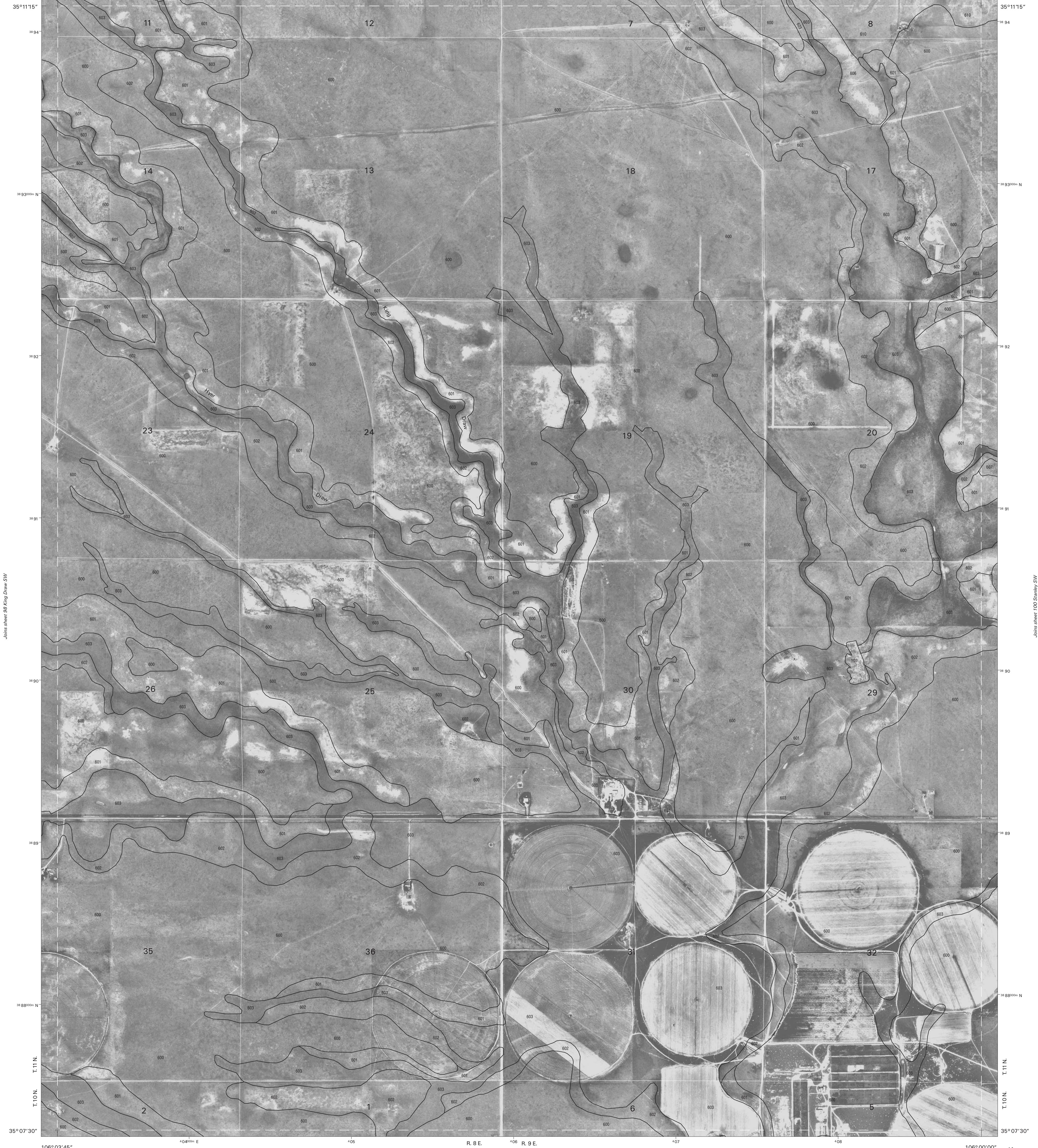
Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.



Joins sheet 89  
King Draw NW

Joins sheet 91  
Stanley NW

Joins sheet 90 King Draw NE  
R. 8 E. 406 R. 9 E.

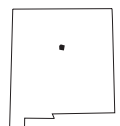


Joins sheet 97  
Moran North NW

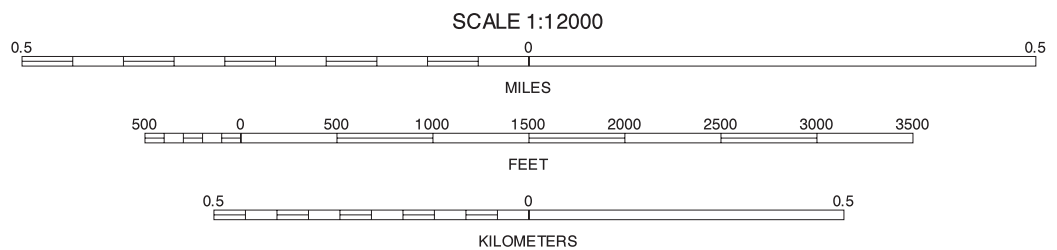
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 89  | 90  | 91  | 89 KING DRAW NW           |
|     |     |     | 90 KING DRAW NE           |
|     |     |     | 91 STANLEY NW             |
| 98  |     | 100 | 98 KING DRAW SW           |
|     |     |     | 100 STANLEY SW            |
|     |     |     | 107 MORIARTY NORTH NW     |
| 107 | 108 | 109 | 108 MORIARTY NORTH NE     |
|     |     |     | 109 LONGHORN RESERVOIR NW |

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KING DRAW SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 99 OF 122

Soil map delineations extending beyond the dashed white quadrangle neoline are for reference only and are included on adjacent map sheets.

Joins sheet 109  
Longhorn Reservoir NW



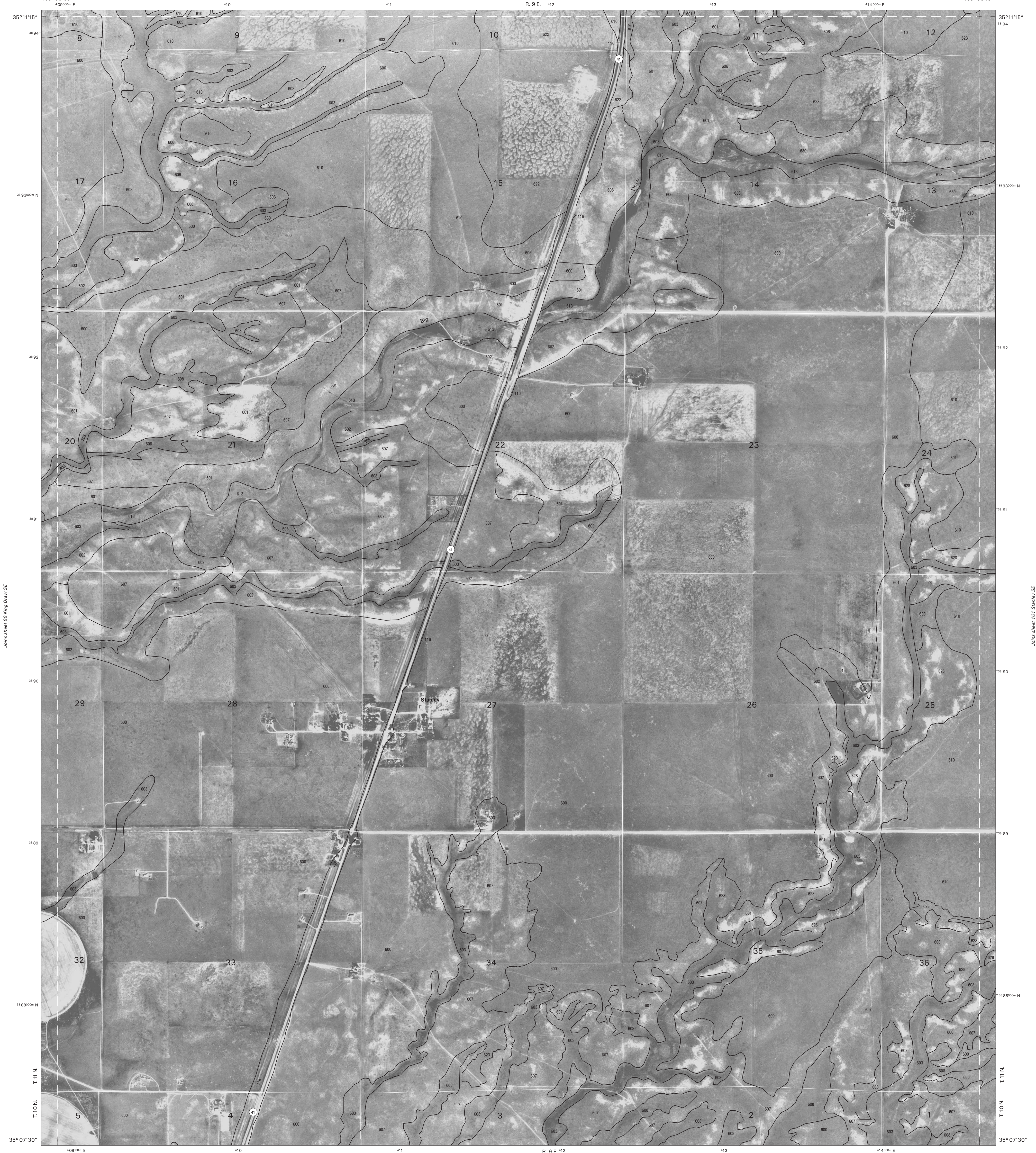
Joins sheet 90  
King Draw NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 91 Stanley NW

SANTA FE COUNTY AREA, NEW MEXICO  
STANLEY SW QUADRANGLE  
SHEET NUMBER 100 OF 122

Joins sheet 92  
Stanley NE





Joins sheet 97  
Stanley NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105°56'15"

Joins sheet 92 Stanley NE

SANTA FE COUNTY AREA, NEW MEXICO  
STANLEY SE QUADRANGLE  
SHEET NUMBER 101 OF 122  
105°52'30"

Joins sheet 93  
White Lakes NW

Joins sheet 100 Stanley SW

Joins sheet 102 White Lakes SW

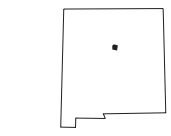
Joins sheet 109  
Longhorn Reservoir NW

Joins sheet 111  
El Cuervo Butte NW

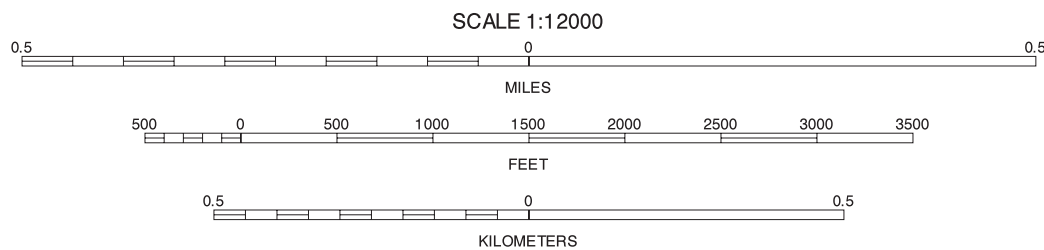
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 91  | 92  | 93  | 91 STANLEY NW             |
|     |     |     | 92 STANLEY NE             |
|     |     |     | 93 WHITE LAKES NW         |
| 100 |     | 102 | 100 STANLEY SW            |
|     |     |     | 102 WHITE LAKES SW        |
|     |     |     | 109 LONGHORN RESERVOIR NW |
|     |     |     | 110 LONGHORN RESERVOIR NE |
| 109 | 110 | 111 | 111 EL CUERVO BUTTE NW    |

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STANLEY SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 101 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjacent map sheets.



Joins sheet 92  
Stanley NE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105°52'30"

Joins sheet 93 White Lakes NW

SANTA FE COUNTY AREA, NEW MEXICO  
WHITE LAKES SW QUADRANGLE  
SHEET NUMBER 102 OF 122  
105°48'45"

Joins sheet 94  
White Lakes NE

Joins sheet 101 Stanley SE

Joins sheet 103 White Lakes SE

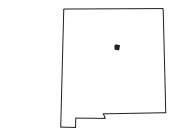
Joins sheet 110  
Longhorn Reservoir NE

Joins sheet 112  
El Cuervo Butte NE

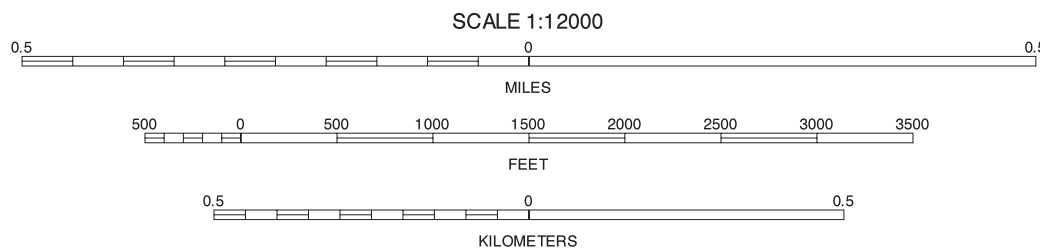
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



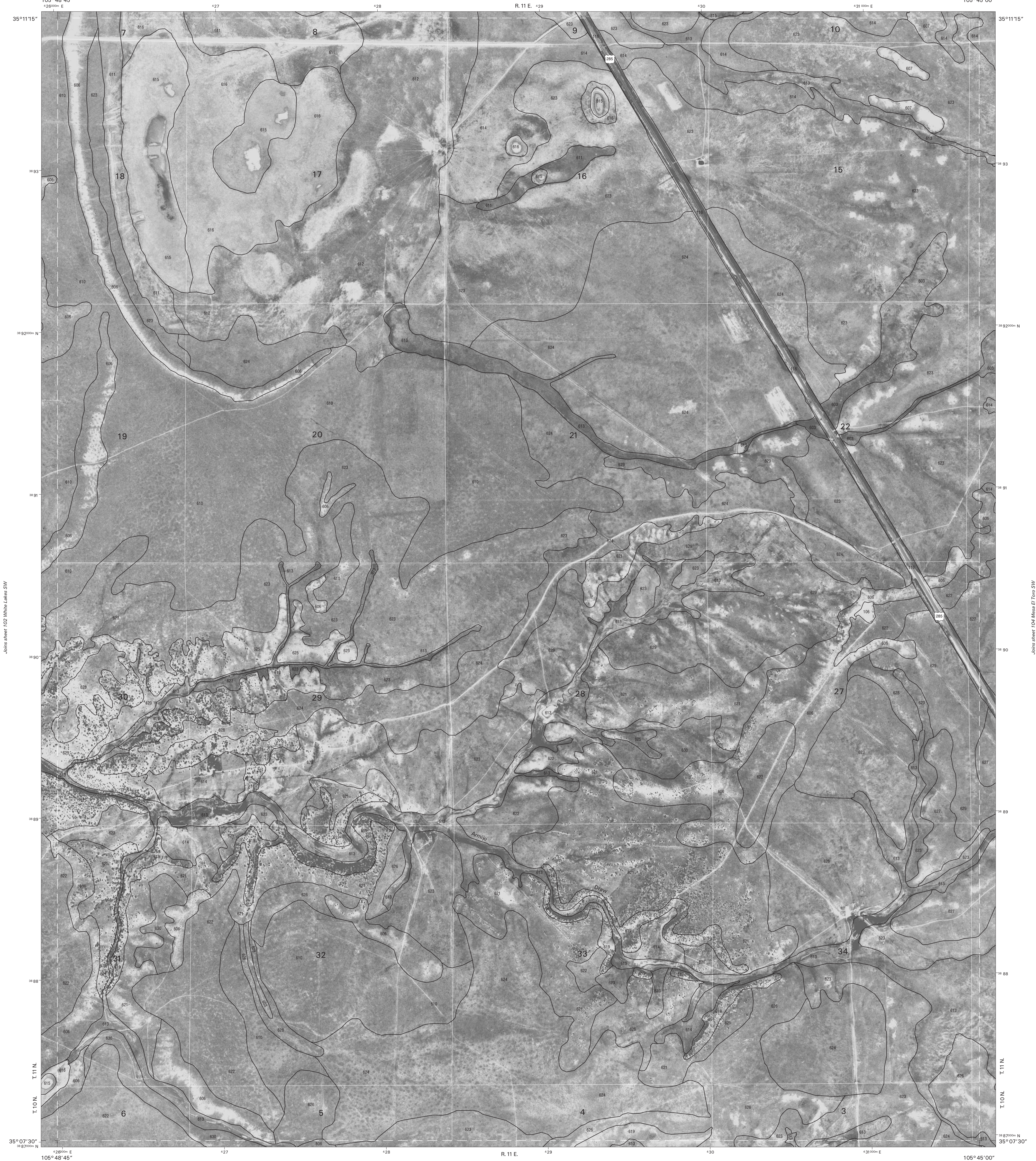
|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 92  | 93  | 94  | 92 STANLEY NE             |
|     |     |     | 93 WHITE LAKES NW         |
|     |     |     | 94 WHITE LAKES NE         |
| 101 |     | 103 | 101 STANLEY SE            |
|     |     |     | 103 WHITE LAKES SE        |
|     |     |     | 110 LONGHORN RESERVOIR NE |
|     |     |     | 111 EL CUERVO BUTTE NW    |
| 110 | 111 | 112 | 112 EL CUERVO BUTTE NE    |

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WHITE LAKES SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 102 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatine are for reference only and are included on adjacent map sheets.

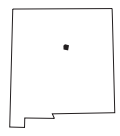




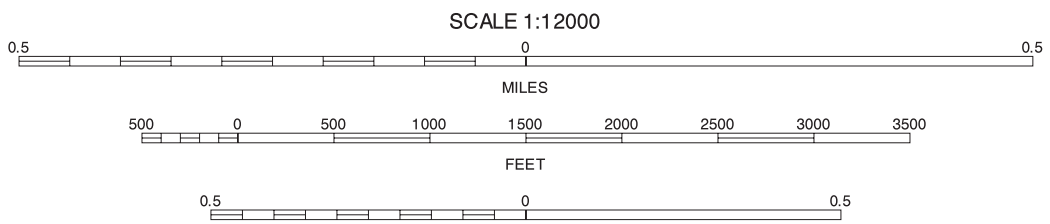
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |     |                    |
|-----|-----|-----|-----|--------------------|
| 93  | 94  | 95  | 93  | WHITE LAKES NW     |
|     |     |     | 94  | WHITE LAKES NE     |
|     |     |     | 95  | MESAE EL TORO NW   |
| 102 |     |     | 102 | WHITE LAKES SW     |
|     |     |     | 104 | MESA EL TORO SW    |
|     |     |     | 111 | EL CUERVO BUTTE NW |
|     |     |     | 112 | EL CUERVO BUTTE NE |
| 111 | 112 | 113 | 113 | CLINE CORNERS NW   |

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WHITE LAKES SE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 103 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.



Joins sheet 94  
White Lakes NE



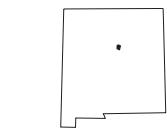
Joins sheet 103 White Lakes SE

Joins sheet 112  
El Cuero Butte NE

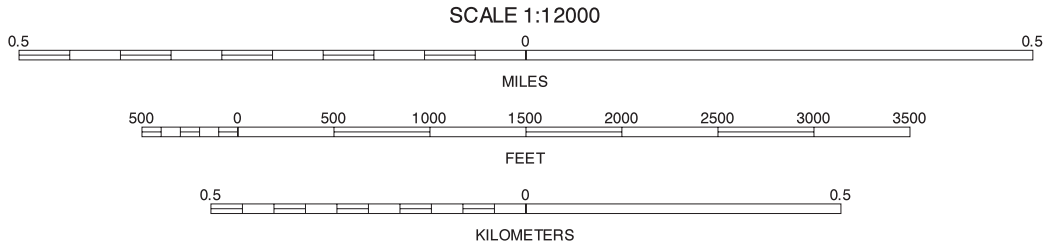
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |    |  |                                                 |
|-----|----|--|-------------------------------------------------|
| 94  | 95 |  | 94 WHITE LAKES NE<br>95 MESA EL TORO NW         |
| 103 |    |  | 103 WHITE LAKES SE                              |
|     |    |  | 112 EL CUERVO BUTTE NE<br>113 CLINES CORNERS NW |

INDEX TO ADJOINING 3.75 MAPS

MESA EL TORO SW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 104 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjoining map sheets.

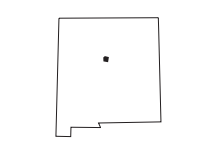




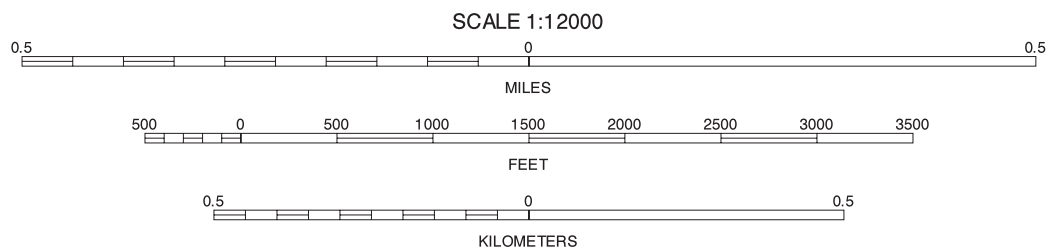
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North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|     |     |                 |
|-----|-----|-----------------|
| 96  | 97  | 96 SAN PEDRO SW |
| 97  | 97  | 97 SAN PEDRO SE |
| 106 | 106 | 106 EDGEWOOD NE |
| 114 | 115 | 114 EDGEWOOD SW |
|     |     | 115 EDGEWOOD SE |

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EDGEWOOD NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 105 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 97 San Pedro SE

R. 7 E. R. 8 E.

Joins sheet 98  
King Draw SW

Joins sheet 96  
San Pedro SW



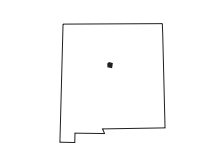
Joins sheet 105 Edgewood NW

Joins sheet 107 Moriarty North NW

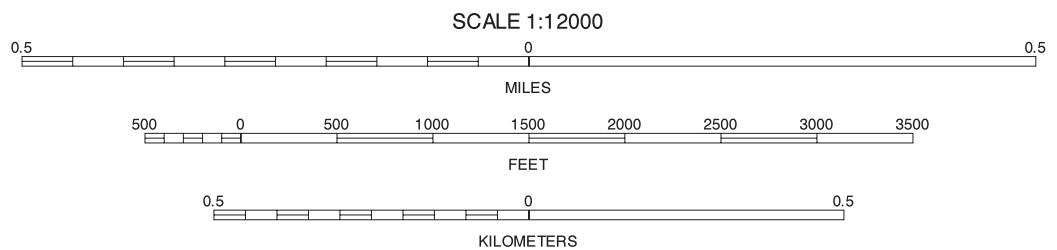
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION



|     |     |     |                       |
|-----|-----|-----|-----------------------|
| 96  | 97  | 98  | 96 SAN PEDRO SW       |
| 96  | 97  | 98  | 97 SAN PEDRO SE       |
| 96  | 97  | 98  | 98 KING DRAW SW       |
| 105 | 106 | 107 | 105 EDGEWOOD NW       |
| 105 | 106 | 107 | 107 MORIARTY NORTH NW |
| 114 | 115 | 116 | 114 EDGEWOOD SW       |
| 114 | 115 | 116 | 115 EDGEWOOD SE       |
| 114 | 115 | 116 | 116 MORIARTY NORTH SW |

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EDGEWOOD NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 106 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 110  
Moriarty North SW

Joins sheet 114  
Edgewood SW



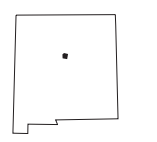
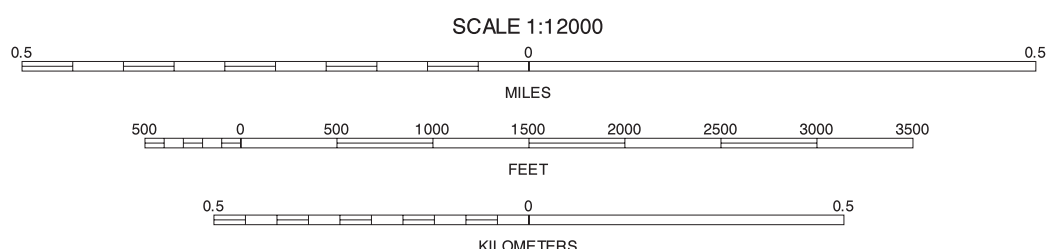


line about 108 Meters North NE

*Joins sheet 116 Moriarty North SW*

Joins sheet 115  
Edgewood SE

NORTH

QUARTER QUADRANGLE  
13-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1

|     |     |     |                       |
|-----|-----|-----|-----------------------|
| 97  | 98  | 99  | 97 SAN PEDRO SE       |
|     |     |     | 98 KING DRAW SW       |
|     |     |     | 99 KING DRAW SE       |
| 106 |     | 108 | 106 EDGEWOOD NE       |
|     |     |     | 108 MORIARTY NORTH NE |
|     |     |     | 115 EDGEWOOD SE       |
| 115 | 116 | 117 | 116 MORIARTY NORTH SW |
|     |     |     | 117 MORIARTY NORTH SE |

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MORIARTY NORTH NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 107 OF 122

Joins sheet 7  
Moriarty North 3



Joins sheet 99  
King Draw SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

SANTA FE COUNTY AREA, NEW MEXICO  
MORIARTY NORTH NE QUADRANGLE  
SHEET NUMBER 108 OF 122

Joins sheet 100  
Stanley SW

Joins sheet 99 King Draw SE



Joins sheet 107 Moriarty North NW

Joins sheet 109 Longhorn Reservoir NW

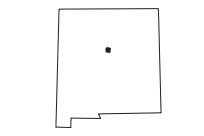
Joins sheet 116  
Moriarty North SW

Joins sheet 118  
Longhorn Reservoir SW

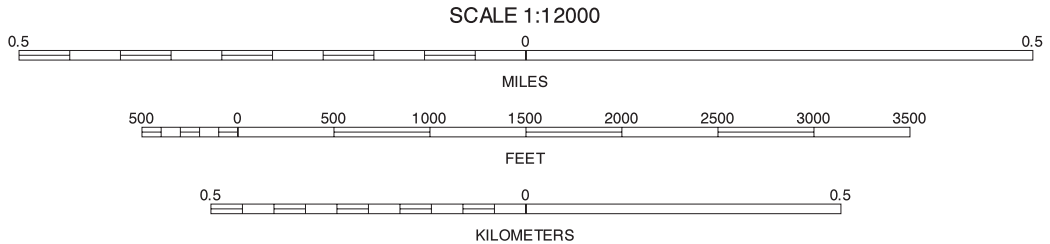
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North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 98  | 99  | 100 | 98 KING DRAW SW           |
|     |     |     | 99 KING DRAW SE           |
|     |     |     | 100 STANLEY SW            |
| 107 |     | 109 | 107 MORIARTY NORTH NW     |
|     |     |     | 109 LONGHORN RESERVOIR NW |
|     |     |     | 116 MORIARTY NORTH SW     |
|     |     |     | 117 MORIARTY NORTH SE     |
| 116 | 117 | 118 | 118 LONGHORN RESERVOIR SW |

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MORIARTY NORTH NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 108 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatlne are for reference only and are included on adjacent map sheets.



Joins sheet 99  
King Draw SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 100 Stanley SW

SANTA FE COUNTY AREA, NEW MEXICO  
LONGHORN RESERVOIR NW QUADRANGLE  
SHEET NUMBER 109 OF 122

Joins sheet 101  
Stanley SE

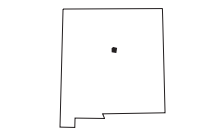


Joins sheet 117  
Moriarty North SE

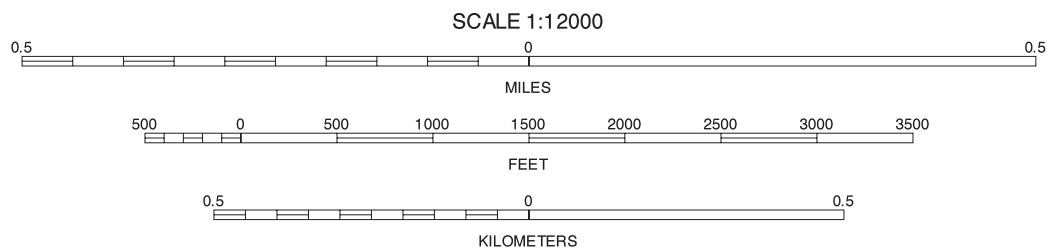
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North American Datum of 1983 (NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 118 Longhorn Reservoir SW

|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 99  | 100 | 101 | 99 KING DRAW SE           |
|     |     |     | 100 STANLEY SW            |
|     |     |     | 101 STANLEY SE            |
| 108 |     | 110 | 108 MORIARTY NORTH NE     |
|     |     |     | 110 LONGHORN RESERVOIR NE |
|     |     |     | 117 MORIARTY NORTH SE     |
|     |     |     | 118 LONGHORN RESERVOIR SW |
| 117 | 118 | 119 | 119 LONGHORN RESERVOIR SE |

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LONGHORN RESERVOIR NW, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 109 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatlne are for reference only and are included on adjacent map sheets.

Joins sheet 119  
Longhorn Reservoir SE

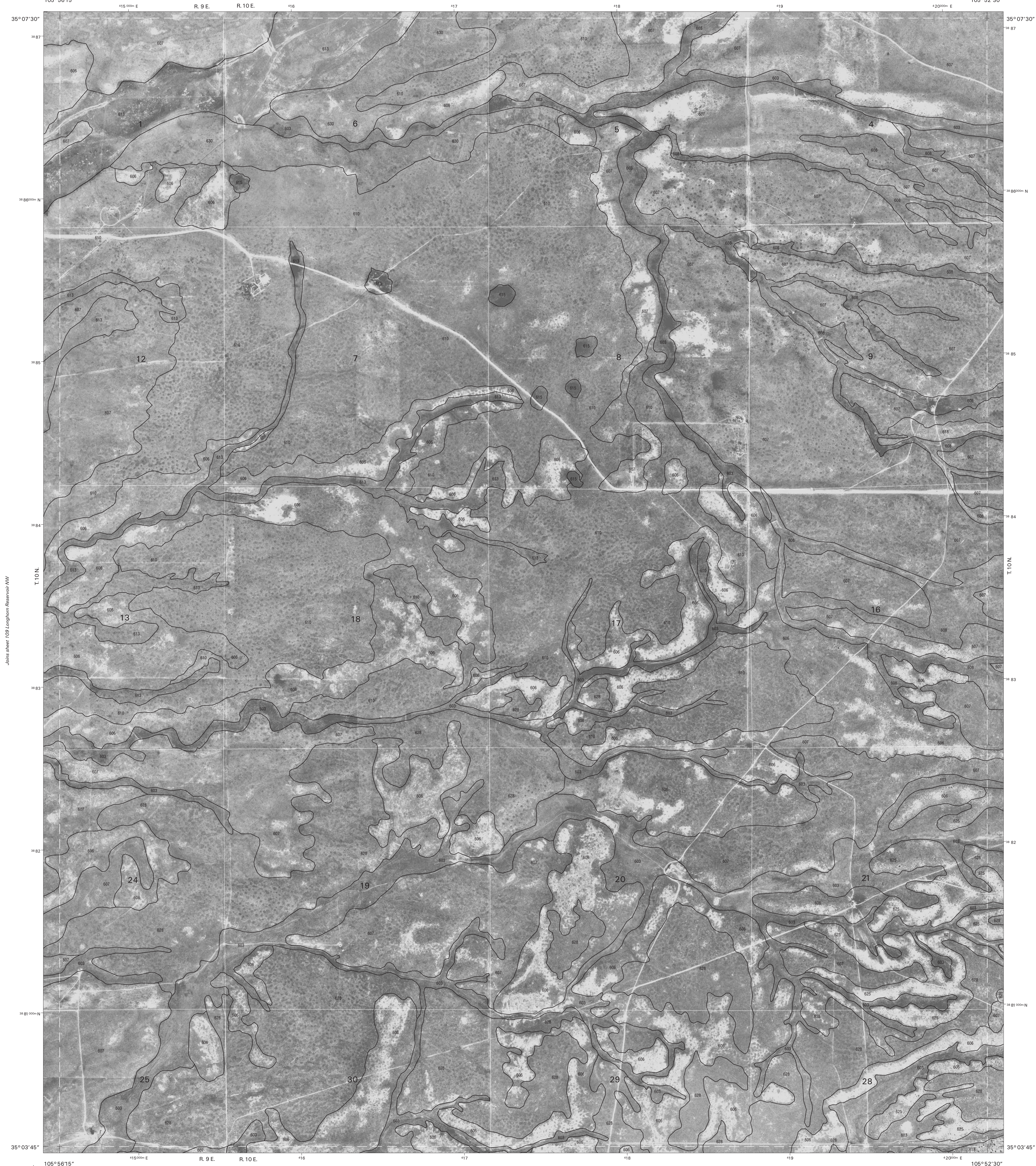


Joins sheet 100  
Stanley SW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

SANTA FE COUNTY AREA, NEW MEXICO  
LONGHORN RESERVOIR NE QUADRANGLE  
SHEET NUMBER 110 OF 122

Joins sheet 102  
White Lakes SW



Joins sheet 109 Longhorn Reservoir NW

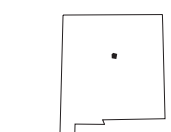
Joins sheet 111 El Cuervo Butte NW

Joins sheet 118  
Longhorn Reservoir SW

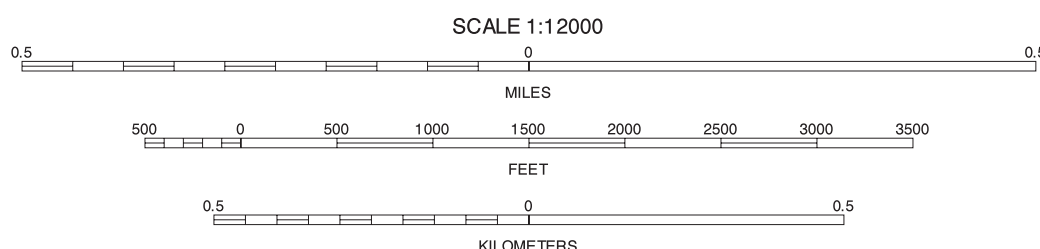
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North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



Joins sheet 119 Longhorn Reservoir SE

|     |     |     |
|-----|-----|-----|
| 100 | 101 | 102 |
| 109 | 110 | 111 |
| 118 | 119 | 120 |

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LONGHORN RESERVOIR NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 110 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 120  
El Cuervo Butte SW



Joins sheet 107  
Stanley SE

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
105°52'30"

Joins sheet 102 White Lakes SW

SANTA FE COUNTY AREA, NEW MEXICO  
EL CUERVO BUTTE NW QUADRANGLE  
SHEET NUMBER 111 OF 122  
105°48'45"

Joins sheet 103  
White Lakes SE

Joins sheet 110 Longhorn Reservoir NE

Joins sheet 112 El Cuervo Butte NE

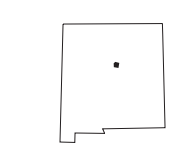


Joins sheet 119  
Longhorn Reservoir SE

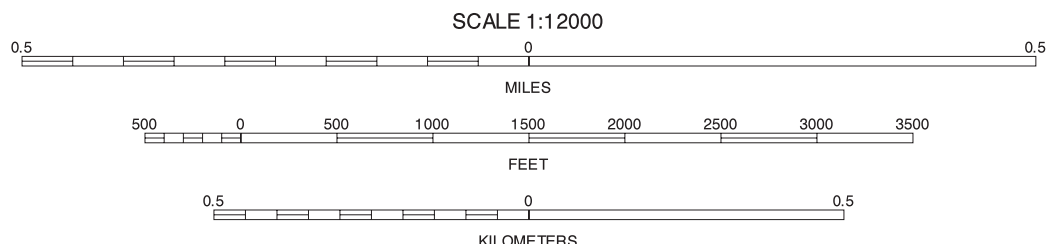
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83). GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |                           |
|-----|-----|-----|---------------------------|
| 101 | 102 | 103 | 101 STANLEY SE            |
|     |     |     | 102 WHITE LAKES SW        |
|     |     |     | 103 WHITE LAKES SE        |
| 110 |     | 112 | 110 LONGHORN RESERVOIR NE |
|     |     |     | 112 EL CUERVO BUTTE NE    |
|     |     |     | 119 LONGHORN RESERVOIR SE |
|     |     |     | 120 EL CUERVO BUTTE SW    |
| 119 | 120 | 121 | 121 EL CUERVO BUTTE SE    |

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Soil map delineations extending beyond the dashed white quadrangle neartline are for reference only and are included on adjacent map sheets.

Joins sheet 121  
El Cuervo Butte SE

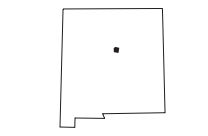




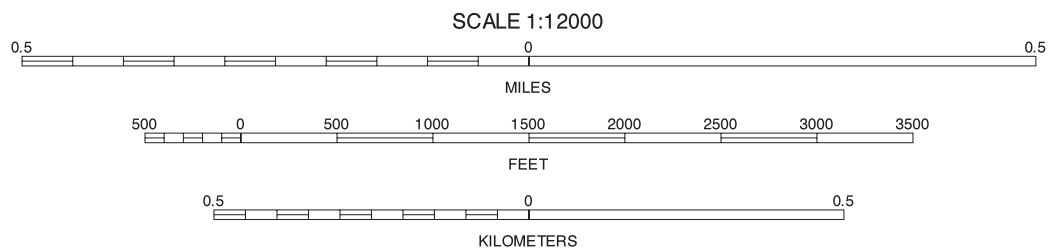
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NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |     |
|-----|-----|-----|
| 102 | 103 | 104 |
| 111 |     | 113 |
| 120 | 121 | 122 |

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103 WHITE LAKES SE  
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111 EL CUERVO BUTTE NW  
113 CLINES CORNERS NW  
120 EL CUERVO BUTTE SW  
121 EL CUERVO BUTTE SE  
122 CLINES CORNERS SW

EL CUERVO BUTTE NE, NEW MEXICO  
3.75 MINUTE SERIES  
SHEET NUMBER 112 OF 122

Soil map delineations extending beyond the dashed white quadrangle neatlne are for reference only and are included on adjacent map sheets.



Joins sheet 104 Mesa El Toro SW



Joins sheet 112 El Cuervo Butte NE

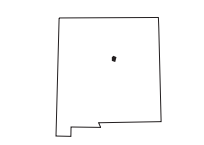
Joins sheet 121  
El Cuervo Butte SE

Joins sheet 122 Clines Corners SW

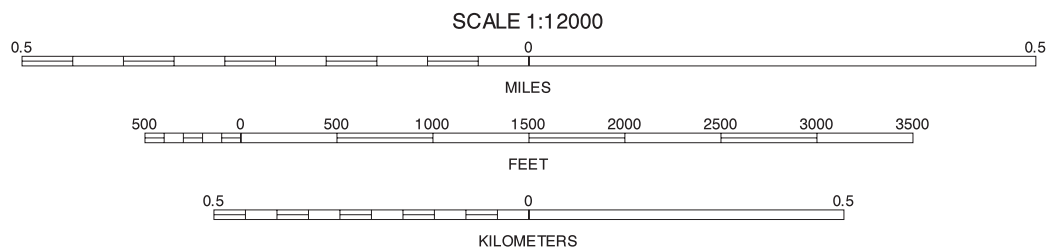
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

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NORTH



QUARTER QUADRANGLE  
LOCATION



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| 112 |     |  |
| 121 | 122 |  |

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3.75 MINUTE SERIES  
SHEET NUMBER 113 OF 122

Soil map delineations extending beyond the dashed white quadrangle neartine are for reference only and are included on adjoining map sheets.

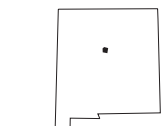




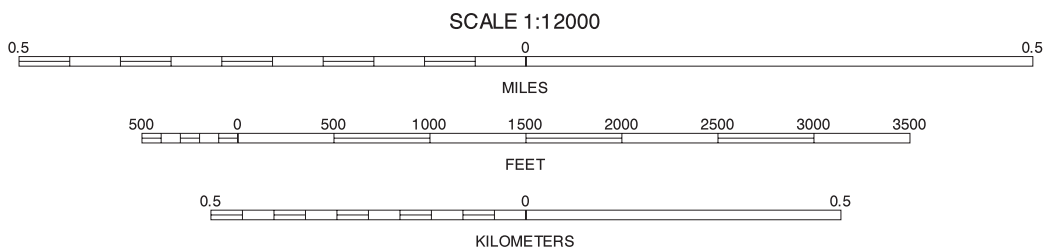
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NORTH



QUARTER QUADRANGLE  
LOCATION



|     |     |                                    |
|-----|-----|------------------------------------|
| 105 | 106 | 105 EDGEWOOD NW<br>106 EDGEWOOD NE |
|     | 115 | 115 EDGEWOOD SE                    |
|     |     |                                    |

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Soil map delineations extending beyond the dashed white quadrangle nealline are for reference only and are included on adjacent map sheets.

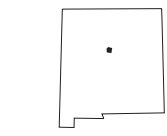




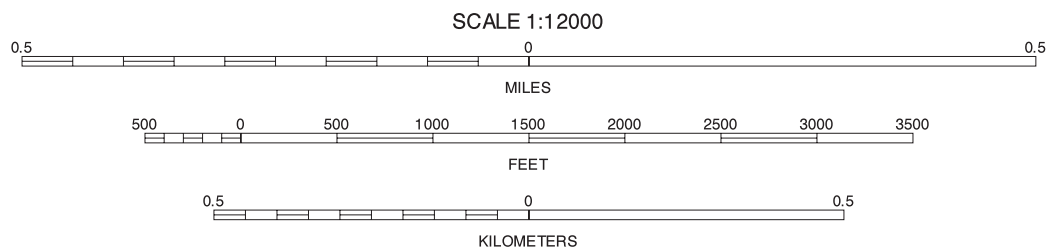
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

North American Datum of 1983(NAD83), GRS80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE  
LOCATION



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| 114 |     | 116 |

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Soil map delineations extending beyond the dashed white quadrangle nealtine are for reference only and are included on adjacent map sheets.



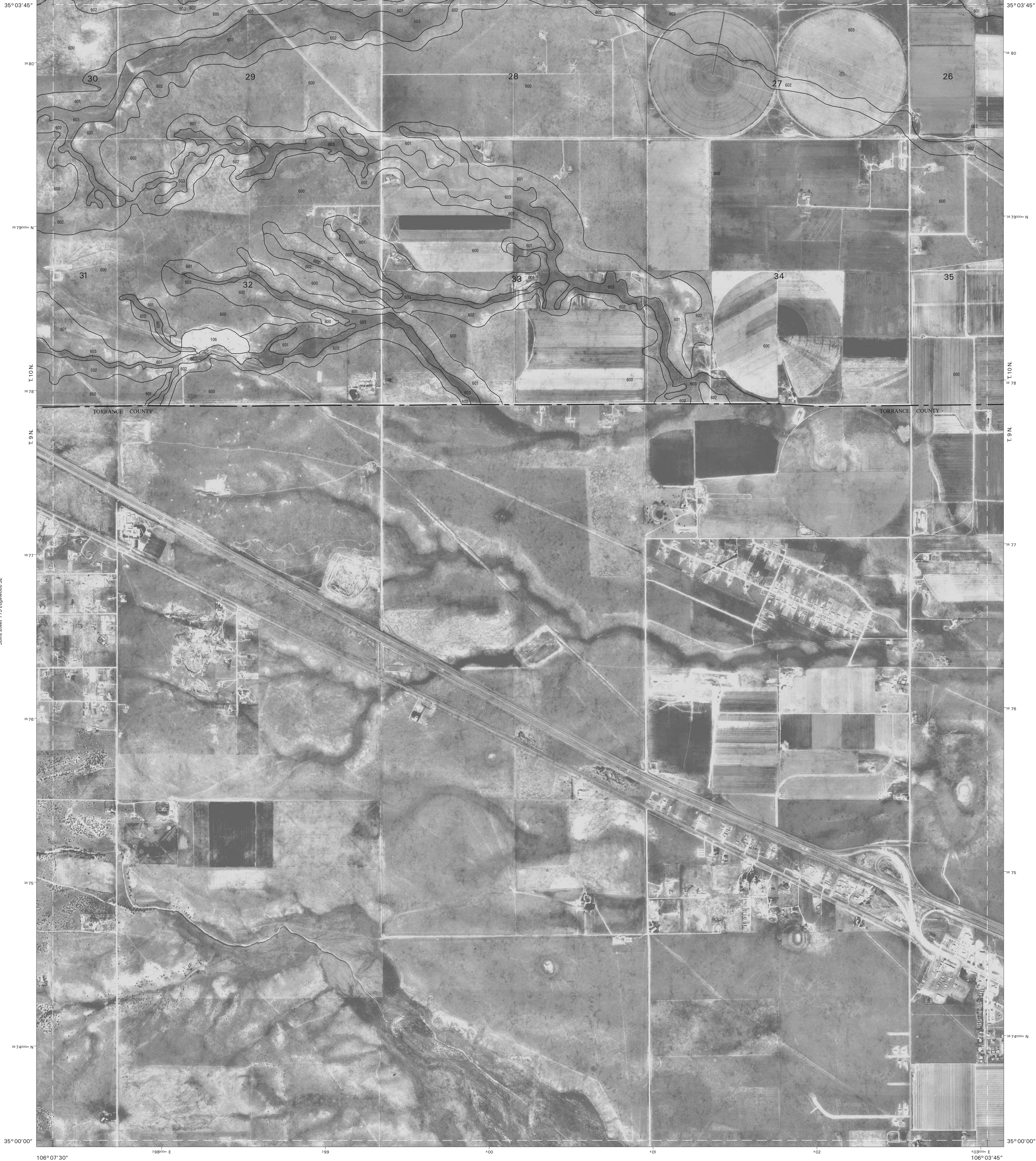
Joins sheet 107 Moriarty North NW

Joins sheet 108 Moriarty North NE

Joins sheet 106 Edgewood NE

Joins sheet 115 Edgewood SE

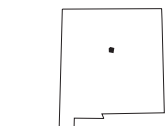
Joins sheet 117 Moriarty North SE



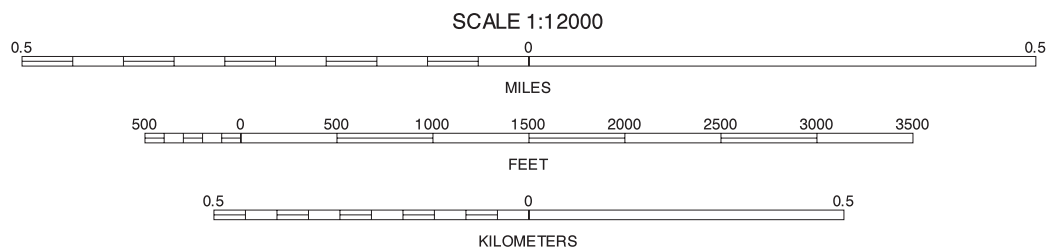
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

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NORTH



QUARTER QUADRANGLE LOCATION



|     |     |     |
|-----|-----|-----|
| 106 | 107 | 108 |
| 115 |     | 117 |

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3.75 MINUTE SERIES  
SHEET NUMBER 116 OF 122

Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



Joins sheet 107  
Moriarty North NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
106° 03' 45"

Joins sheet 108 Moriarty North NE

SANTA FE COUNTY AREA, NEW MEXICO  
MORIARTY NORTH SE QUADRANGLE  
SHEET NUMBER 117 OF 122  
106° 00' 00"

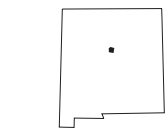
Joins sheet 109  
Longhorn Reservoir NW



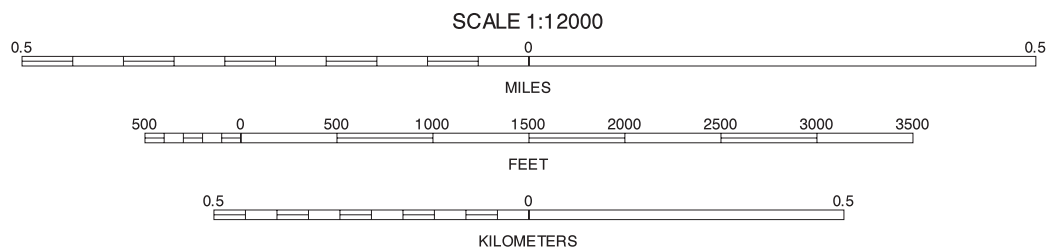
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

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NORTH



QUARTER QUADRANGLE  
LOCATION



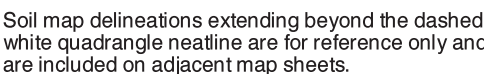
|     |     |     |
|-----|-----|-----|
| 107 | 108 | 109 |
| 116 |     | 118 |

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Soil map delineations extending beyond the dashed white quadrangle nealline are for reference only and are included on adjacent map sheets.





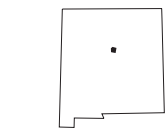




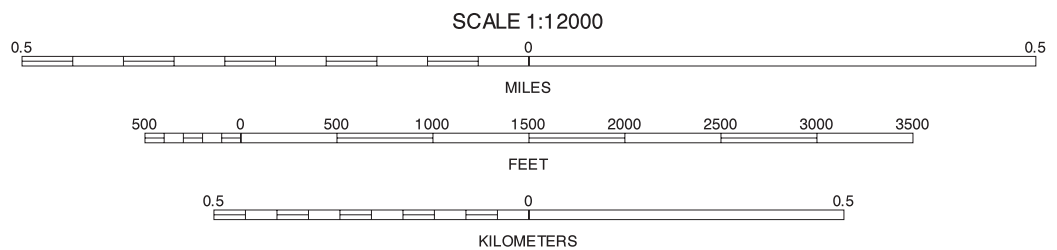
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NORTH



QUARTER QUADRANGLE LOCATION



|     |     |     |
|-----|-----|-----|
| 109 | 110 | 111 |
| 118 | 119 | 120 |

109 LONGHORN RESERVOIR NW  
110 LONGHORN RESERVOIR NE  
111 EL CUERVO BUTTE NW  
118 LONGHORN RESERVOIR SW  
120 EL CUERVO BUTTE SW

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LONGHORN RESERVOIR SE, NEW MEXICO  
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Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets.



NORTH

SCALE 1:12000

0.5 0 0.5

MILES

500 0 500 1000 1500 2000 2500 3000 3500

FEET

0.5 0 0.5

KILOMETERS

|     |     |     |                                                                               |
|-----|-----|-----|-------------------------------------------------------------------------------|
| 110 | 111 | 112 | 110 LONGHORN RESERVOIR NE<br>111 EL CUERVO BUTTE NW<br>112 EL CUERVO BUTTE NE |
| 119 |     | 121 | 119 LONGHORN RESERVOIR SE<br>121 EL CUERVO BUTTE SE                           |
|     |     |     |                                                                               |

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



Soils sheet 111  
El Cuervo Butte NW

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 112 El Cuervo Butte NE

SANTA FE COUNTY AREA, NEW MEXICO  
EL CUERVO BUTTE SE QUADRANGLE  
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Joins sheet 113  
Clines Corners NW



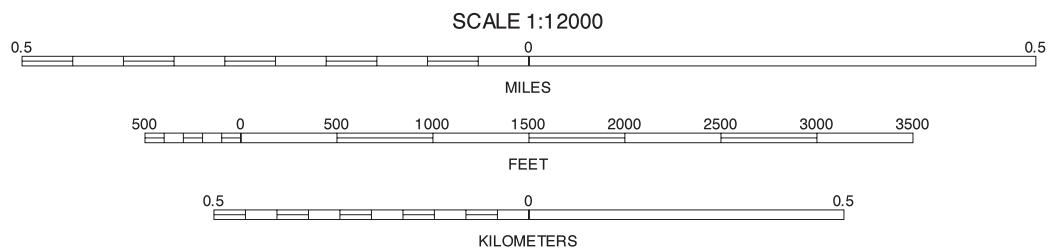
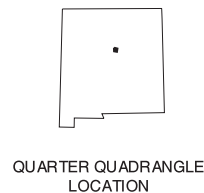
Joins sheet 120 El Cuervo Butte SW

Joins sheet 122 Clines Corners SW

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1991-1998 aerial photography. Administrative boundaries were acquired from the State of New Mexico. Boundaries may have been edited to conform with features represented on the publication orthophotography or to enhance the clarity of the soils information.

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NORTH



|     |     |     |                                                                                                                              |
|-----|-----|-----|------------------------------------------------------------------------------------------------------------------------------|
| 111 | 112 | 113 | 111 EL CUERVO BUTTE NW<br>112 EL CUERVO BUTTE NE<br>113 CLINES CORNERS NW<br>120 EL CUERVO BUTTE SW<br>122 CLINES CORNERS SW |
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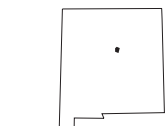




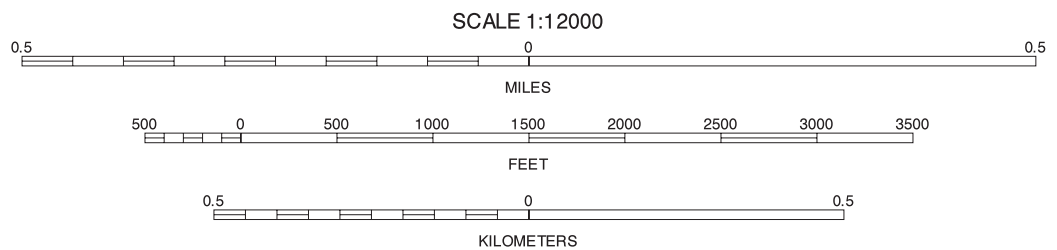
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NORTH



QUARTER QUADRANGLE  
LOCATION



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| 112 | 113 |  |
| 121 |     |  |
|     |     |  |

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